CALCULATED RISKS
Find out how IT innovators place successful bets on bleeding-edge technology. Page 52

GATES' NEW ROLE
Microsoft chairman appoints Steve Ballmer CEO and takes on software architect mantle. Page 6

PROTECTING CUSTOMERS
Ralph Nader warns that digital signature legislation in Congress might leave consumers at risk. Page 32

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AOL DEAL ABETS RICHER CONTENT

Buyout expected to boost broadband access

BY LINDA ROSENCRANCE

Last week's stunning announcement that America Online Inc. will acquire Time Warner Inc. may change the way companies develop their Web pages, by speeding up the development of high-speed Internet access and possibly rekindling "browser wars," Web developers and analysts said.

AOL/TIME WARNER

If the all-stock deal is successful, the companies, valued at $350 billion, see themselves positioned to offer broadband access and to speed development of the Internet and interactive content, according to a joint statement. And that could spark changes in the way companies design and build Web sites aimed at consumers.

"When it comes to designing Web site content, the increasing use of broadband devices to access the Internet [means companies] will have to produce more rich media like we see on television," said Dan MacKeigan, a senior Internet analyst at Arlington, Va.-based Friedman, Billings, Ramsey & Co.

Tom Lix, president and CEO of NewMarket Network, a

AOL Deal, page 16

WEB SITE UPGRADES: BUILD OR BUY?

Growth puts e-suites under new scrutiny

BY CAROL SLIWA

Britannica.com Inc. is considering scrapping its Open Market Inc. catalog software because it thinks the off-the-shelf package isn't flexible enough to handle the content customization the company now wants to do.

MICHAEL KRUPIT: Proprietary tools have helped CDNow

VitaminShoppe.com is already working with a consultant, weighing a Unix-based, database-driven Web site that most likely will replace the Microsoft Corp. Site Server-based system that gave the New York-based retailer a quick and relatively inexpensive entry to the Web.

Both plans illustrate the difficult choices companies confront as they expand or create online business sites. Either they can build and maintain their sites, tailoring them directly to their needs as long as they have the resources to do it, or they can launch a site rapidly using an off-the-shelf e-commerce suite and hope it won't require too much customization or limit their op-

Build or Buy, page 16

IT SPENDING LETS LOOSE, POST-Y2K

Scarcity of Y2K problems leads many companies to end systems lockdowns

BY THOMAS HOFFMAN AND JULIA KING

Call it the January thaw of the Y2K freeze.

Big companies such as Sears and Allstate, which have experienced few if any Y2K-related glitches, have started to end self-imposed Y2K systems lockdowns and are moving full-steam ahead with information technology projects that had been put on the back burner.

Still others are busy posting press releases and nailing up new door plaques as CIOs at several companies switch gears or depart altogether in post-Y2K job shuffles.

And all around, the mantra seems to be speed, speed, speed.

Retail giant Sears, Roebuck and Co., for example, is already in the thick of developing a new freight tracking system, which, like all IT projects to be launched by the retailer this

IT Spending, page 93

DERAILED

THE JUNE MERGER OF NORFOLK SOUTHERN and Conrail has been a spiral of mishaps — misrouted trains, congested tracks, lost cargo and lost customers. It all started with a botched effort to integrate computer systems at the two railroads, reports Kim S. Nash. Some of the technology glitches have been fixed, but even seven months after the merger, crews are still misscheduled, and customers are still temporarily losing their products somewhere on 21,600 miles of track.

Story begins on page 20.

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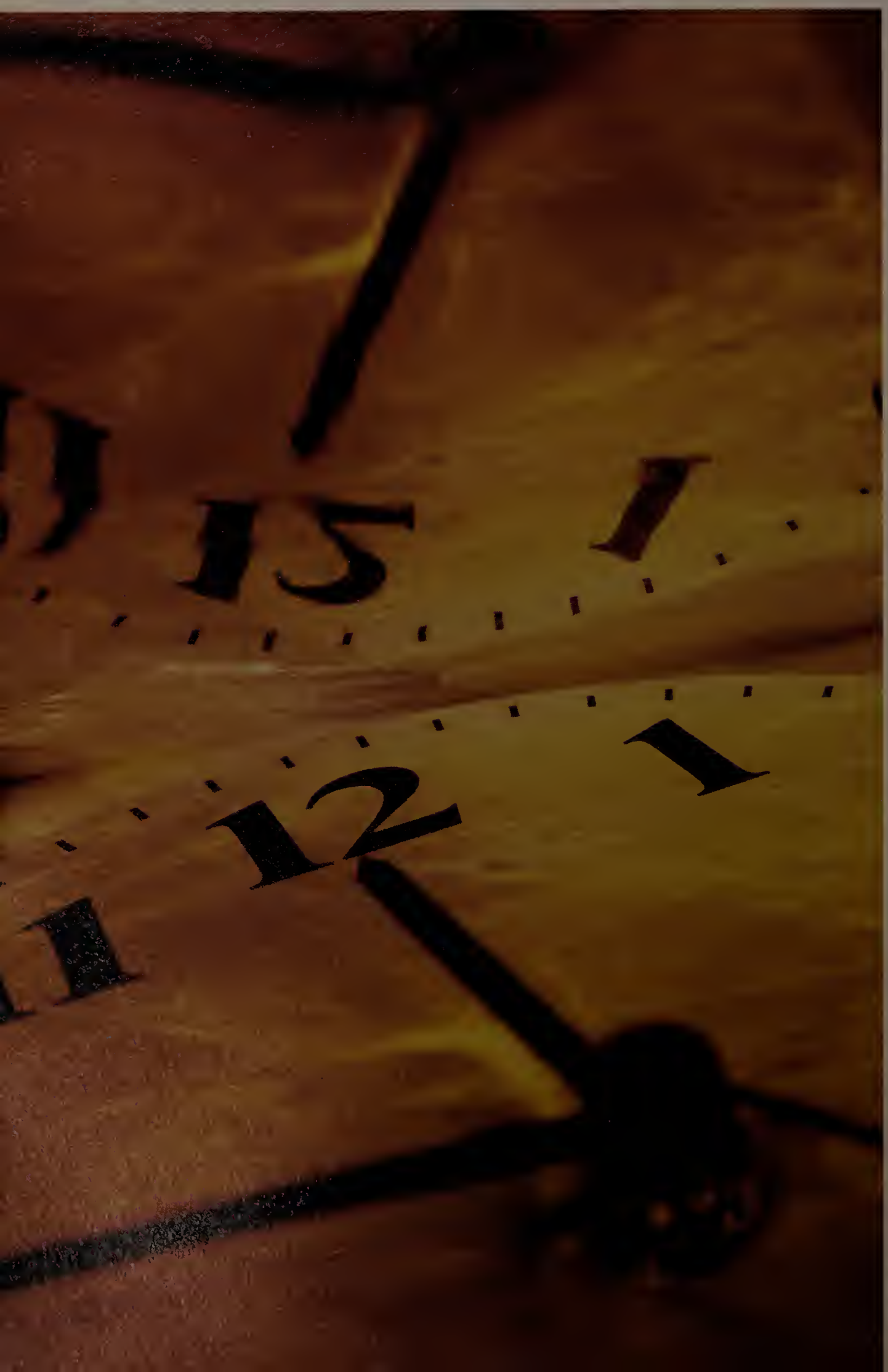

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IT IN 2010

What will the corporate IT organization look like in a decade? No one knows for sure, but experts agree it will look different, and they're leaning toward the theory that it will focus more on the customer and on outside trading partners. Page 50

GIORGIO PALMISANO

KILLING PORN

A new activist group is targeting child pornography on the Internet and feels justified in killing offending servers if it has to, says spokesman Kent Browne. Page 40

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> RATES ARE GOING TO GO UP A LOT AND, LARGELY, [IT SHOPS] ARE GOING TO GET SCREWED.
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> STAN LEPEAK, ANALYST, META GROUP INC., SAYING THE SHORTAGE OF WEB CONSULTANTS WILL INCREASE PRICES AND LOWER QUALITY AS AVAILABLE RESOURCES ARE STRETCHED THIN. SEE PAGE 91.

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29 MANUFACTURERS could be moving to simpler, faster software, which will mark the next stage of IT innovation, says Allan Alter.

32 U.S. COMPANIES will be saving $30 billion this year by not having to deal with Y2K. John Gantz says IT should use that "windfall" while it basks in stronger credibility.

32 CONSUMER ADVOCATE Ralph Nader says Congress must protect consumers in any digital-signature legislation.

42 COMPANIES should buy rather than build dot-coms to keep up in today's Internet economy, says Kevin Fogarty.

46 PETER G. W. KEEN questions IT's readiness to take on the inherent business challenges of e-commerce.

AT DEADLINE

BP Amoco in $200M Outsourcing Pact

British oil company BP Amoco PLC last week expanded its finance, accounting and information technology outsourcing contract with New York-based PricewaterhouseCoopers in a 10-year, $200 million deal that includes the company's Canadian operations. Dan Kane, a spokesman for BP Amoco, said he expects the outsourcing arrangement to reduce the company's total costs by as much as 30%.

Auto Web Deals

Automakers Ford Motor Co. in Dearborn, Mich., and General Motors Corp. in Detroit launched major Web alliances last week. Ford announced it will work with Santa Clara, Calif.-based Yahoo Inc. on personalized Web services and voice-activated Web access in its vehicles. GM inked deals with Internet access providers America Online Inc. and NetZero Inc. in Westlake Village, Calif., to offer targeted Web marketing.

Nasdaq Goes Overseas

Nasdaq Stock Market Inc. in New York has formed a joint venture with a software developer in India to create Internet-based trading systems aimed at supporting Nasdaq-Japan and Nasdaq-Europe when those electronic markets go live next year. The joint company, called IndigoMarkets, will be supported by SSI Technologies Inc. in Chennai, India.

Short Takes

James R. Kinney, longtime CIO at KRAFT FOODS INC. in Northfield, Ill., has announced plans to retire in March. Steve Finnerty, Kraft's vice president and chief technology officer since 1998, will succeed Kinney. . . . New York-based BARNESANDNOBLE.COM LLC CEO Jonathan Bulkeley resigned last week to pursue interests in other Internet companies. . . . SAP AG said John Milana resigned as chief financial officer at its U.S. subsidiary. . . . Struggling Netherlands-based BAAN CO. lost its second top executive in two weeks with the resignation of Chief Financial Officer James Mooney. . . . NOVELL INC shipped NetWare 5.1 last week.

Move to Single Global ERP System No Easy Task

Implementing Oracle's centralized vision requires tremendous work, says user

BY CRAIG STEDMAN

USERS WHO plan to follow Oracle Corp.'s new road map for centralizing their global enterprise resource planning (ERP) systems on a single database server may have a lot of prep work to do first.

Just ask Millipore Corp.

The maker of water-filtration devices is one of the first users to sign on to install a single global ERP system that's supposed to be made possible by an Oracle application upgrade in the next few months.

The $700 million manufacturer shifted its European operations from their own ERP server to one at company headquarters in Bedford, Mass., two months ago, leaving only its Japanese unit on a separate system. Millipore executives last week said putting everything on the U.S. server should reduce data center costs and give end users a unified view of the company's business.

But getting there won't be a simple task.

Proceeding With Caution

Millipore has already done heavy lifting on both the business and technology sides, and there's plenty more that needs to be done before the unified system can become a reality late this year.

The project team plans to tread carefully to try to make sure "that we're not selling something we can't deliver," said Michael Dapcic, manufacturing business systems manager at Millipore. "We have a very sensitive user base, and they're very unforgiving when it comes to response times."

Steps the company has already taken include a six-month effort to create a common accounting structure for Millipore's business units and an overhaul of the company's network infrastructure that was completed last month.

Still to come, Dapcic said, is a database upgrade, a switch from Oracle's green-screen applications to its Web-based software and heavy amounts of testing to gauge how well the centralized system will be able to handle end-user workloads.

Millipore has also assigned more than a half-dozen employees to spend 12 weeks helping Oracle's developers debug a new order management module that's part of the application upgrade needed to run a single global system.

"We're hoping we can get a much cleaner product than we usually do when it comes off the production line [at Oracle]," Dapcic said.

Inherent Risk

Millipore's goal is to test the unified system in the summer and go live with it by October, he said. The company wouldn't disclose how much the whole project is expected to cost.

The order management software is due in May, and the rest of Oracle's Release 11i upgrade is supposed to ship next month. Oracle originally promised the new ERP release would be ready last fall but then ran into delays.

Oracle last week said an 18-month project to put all of its internal operations on one Release 11i-based global system remains on track for completion by the end of this year.

But Lance Travis, an analyst at AMR Research Inc. in Boston, said he's skeptical that many users will follow Oracle's lead. "In theory, it sounds like a great idea," Travis said. "But there's a lot of risk."

JUST THE FACTS

Millipore Fuses Systems

The promise: Installing a single global ERP system is expected to lower IT support costs and eliminate the need to consolidate and reconcile data from global servers. Users should get immediate access to information from any of Millipore's operations.

The challenge: Millipore has to make major technology changes to prepare for the unified system. The company is switching from Oracle's green-screen ERP software to new Web-based applications, and its networks and databases also need to be upgraded.

The status: The number of regional ERP servers has already been cut from five to two. But it's expected that October will be when the makeover is completed and all of Millipore's operations are running on a single server at company headquarters.

For example, users with a single global system "can't take a sort of backwater operation and install new technology there to see if it works," he added. "It's all or nothing."

That's one of the reasons Millipore plans to move ahead cautiously, Dapcic said. Another big concern is how much its systems will be strained by switching to Oracle's graphical user interface, which is required with Release 11i.

Millipore beefed up its networks by installing new 3Com Corp. switches and doubling or even tripling much of its wide-area bandwidth. But the Web-based graphical interface "may change the picture again," said Ram Prabhu, Millipore's corporate telecommunications manager. "We don't have a good understanding of [its] bandwidth requirements."

To try to get a better idea, Millipore is taking yet another step: giving about one-third of the 300 heavy-duty ERP users in its manufacturing operations a Windows-based version of Oracle's software to start performance testing before Release 11i is available. ◗

MOREONLINE

For more coverage of Oracle and enterprise resource planning, visit our Web site.
www.computerworld.com/more

Travel Site Faces Integration Challenges

The 27 airlines use myriad systems

BY STACY COLLETT

The travel megasite under development by four U.S. airlines got a huge boost last week after 23 U.S. and foreign carriers signed on as associate members. But the added support will leave IT with a big headache.

Nicknamed T2, the Web site is a joint project of UAL Corp.'s United Air Lines Inc., Delta Air Lines Inc., Northwest Airlines Inc. and Continental Airlines Inc. It will offer prices equal to or lower than those available from other travel sources, officials said.

But good news for customers is not-so-good news for the Web site's information technology staff, which is now challenged with linking the myriad global distribution systems used for ticketing. Each system contains different data formats, database formats and a hodgepodge of custom applications developed for each user, observers said.

These technology issues are different from those faced at travel sites like Travelocity.com and Expedia.com because the new site will offer consumers the Internet-only fares that until now have been available only from individual airline sites.

"This [technology] will be unique in offering [Internet-only] inventories," said Ben Burnett, a Chicago-based vice president at The Boston Consulting Group, which is developing the site.

Developers plan to launch the site by midyear, which industry watchers said is a reasonable goal — with some patchwork. ◗

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Virender Ahluwalia, Director, Finance, Vertical Networks, Inc.

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Ballmer Becomes CEO of Microsoft

Gates to lead software development; move could help Redmond in antitrust talks

BY KIM S. NASH, PATRICK THIBODEAU AND DOMINIQUE DECKMYN

BILL GATES stepped down as Microsoft Corp.'s CEO last week to take charge of a new "end-to-end" software plan designed to infuse all Microsoft products with Internet capabilities.

Microsoft President Steve Ballmer succeeds Gates as CEO; Gates will remain chairman of the company.

The announcement came at the end of a week of rumors and published reports alleging that the U.S. Department of Justice proposed breaking up the company during antitrust settlement talks (see related story, page 24). The Justice Department declined to comment on possible remedies.

Both executives insisted that the changes have nothing to do with those talks. But some observers said the new software plan sends a signal that Microsoft is more adamant than ever about blurring the lines between its operating systems, applications and the Internet.

One of Ballmer's first acts as CEO was to accuse the federal government of being sneaky.

"I believe the leaks are deliberate. I don't think there's any doubt about that," Ballmer said in a press conference. "It would be absolutely reckless and irresponsible for anyone to try to break up this company. It would be unprecedented and the single greatest disservice that anybody could do to consumers in this country."

But if Gates' decision to change management roles means he'll have less involvement with the lawsuit, it could improve the settlement odds, according to Harvey Saferstein, an antitrust lawyer at Fried, Frank, Harris, Shriver & Jacobson in Los Angeles.

New Job for Gates

Meanwhile, Gates created a new position for himself: chief software architect. He plans to spend 100% of his time on technology development, leading Microsoft's product teams in a new software initiative, dubbed Next Generation Windows Services. The plan won't be fully disclosed until April, and products are slated to ship gradually during the next three years.

The blueprint calls for creating software that meshes a person's online life with his desktop applications. For example, a Web server-based application could track an executive's airline flights and automatically notify his family by pager that he would be late getting home, Ballmer explained.

Microsoft also plans to offer its entire product line both as shrink-wrapped packages and by subscription over the Internet, Gates said (see story, page 14).

Rival companies are ahead of Microsoft, said Chris LeTocq, an analyst at Gartner Group Inc. in San Jose, citing Sun Microsystems Inc.'s upcoming StarPortal, as well as Desktop.com Inc. and Halfbrain.com Inc., two start-ups that provide virtual "Webtops" with applications. Microsoft's "whole purpose [here] is to freeze the developers, to keep the developers looking at Microsoft and not at the other technologies out there," he said.

Dave Snider, a network manager at Load King Manufacturing Inc. in Jacksonville, Fla., said he doesn't believe Gates' new role will make much of a difference. "I don't think really any of their business practices will change," he said. ◗

Redmond Loses a Round in Permatemp Suit

BY CRAIG STEDMAN AND CHRISTINE McGEEVER

Employers of high-tech contract workers are being urged to re-examine their benefits policies after Microsoft Corp. lost another legal round over its treatment of so-called permatemps.

The U.S. Supreme Court last week rejected Microsoft's appeal of a lower court's ruling that as many as 10,000 temporary workers should have been allowed to buy the company's stock under an employee discount plan. The ruling stated that Microsoft had to open that stock plan to permatemps who had worked at least five months in any 12-month period. Microsoft argued that the eligible group should be much smaller.

It was the second time the high court rejected a Microsoft appeal in the class action suit, which was filed in 1992. Two years ago, the court denied an appeal on the issue of whether temporary workers at the company qualified for any benefits.

The Microsoft case is being closely watched by technology industry groups and legal observers because it could force companies to offer some benefits to temporary and contract workers who are hired for long-term assignments.

The Supreme Court's decision should push other companies — and not just high-tech vendors — "to make sure they're not exposing themselves to the same kind of lawsuits," said Ken Dort, a partner at technology law firm Gordon & Glickson LLC in Chicago.

The Information Technology Association of America (ITAA) in Arlington, Va., which filed a friend-of-the-court brief supporting Microsoft, blasted the Supreme Court's decision. "This is a 19th-century court making outdated decisions about a 21st-century workforce," said Harris Miller, ITAA president.

The suit must go back to U.S. District Court in Seattle for final decisions on issues such as how much discounted stock workers should be able to buy.

A Microsoft spokesman said the vendor is "disappointed the [Supreme Court] has decided now is not the time to review the issues raised in the latest appeals court opinion."

But he said Microsoft doesn't expect the decision to have a big impact on the case. ◗

Numbers Game

Rulings on how many temps might be eligible for Microsoft benefits:

- A U.S. District Court judge in Seattle ruled that only about 300 temps employed at Microsoft between 1987 and 1990 could claim the right to buy stock at discounted prices.
- The 9th U.S. Circuit Court of Appeals in San Francisco overturned that decision last spring, opening the case to include up to 10,000 people who did work for Microsoft from 1987 on.

Microsoft Settles Caldera Suit for About $155M

Move unlikely to impact antitrust talks

BY KIM S. NASH

Microsoft Corp. last week paid at least $155 million to settle a private antitrust lawsuit brought by Caldera Inc.

The settlement isn't expected to influence separate antitrust settlement talks now under way between Microsoft and the U.S. Department of Justice (see story left).

The settlement value wasn't revealed, but Microsoft said it will cut into quarterly earnings by 3 cents per share. That puts the value of the deal at at least $155 million.

DOS Duel

Orem, Utah-based Caldera, a Linux and embedded systems developer, sued Microsoft in July 1996 for allegedly using its monopoly power in operating systems to unfairly squelch competition in the DOS market. The suit accused Microsoft of illegally tying its MS-DOS to Windows 3.1 and intentionally creating incompatibilities between Windows and DR-DOS, which Caldera now owns. Microsoft, which consistently denied the charges, had tried unsuccessfully to get most of the case dismissed.

The settlement, signed three weeks before a trial was set to start, leaves several questions unanswered. Chief among them: Did Microsoft strong-arm PC makers into favoring its version of DOS?

BRYAN SPARKS: "Mixed emotions" on quick settlement

"I have mixed emotions," said Bryan Sparks, CEO of Lineo Inc., a Caldera spin-off. "We came up with a number that if [Microsoft] met, we would settle. And in a single day, they [did]."

Microsoft wouldn't have settled had it not feared evidence Caldera planned to present, a Caldera spokesman claimed.

Not so, responded a Microsoft spokesman. "There's uncertainty in any legal case. We would have been comfortable moving ahead, but we always look for a way to come to a fair settlement," he said.

The deal is unlikely to affect settlement talks in the federal government's antitrust case against Microsoft, said Mark Schechter, a lawyer at Howrey & Simon in Washington.

That's because the U.S. Department of Justice is looking for a resolution that would "limit Microsoft's ability to engage in conduct designed to maintain its monopoly position," said Schechter. The Caldera settlement, which was strictly monetary, "doesn't do that," he said.

If damaging evidence had surfaced during the Caldera trial, it could have given more ammunition to consumers separately suing Microsoft in a pile of class action lawsuits. At least 76 such suits — including two last week — have been filed since November. ◗

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BRIEFS

Win 2K Virus Detected

Symantec Corp.'s Antivirus Research Center said it has found a virus that targets Windows 2000, Microsoft Corp.'s unreleased operating system.

Known as Win2000.Install or W2K.Installer, the virus inflicts no damage. Cupertino, Calif.-based Symantec said it updated its antivirus software last week to recognize and eliminate the virus.

Schwab Buys Bank

Charles Schwab Corp.'s $2.7 billion purchase of New York-based U.S. Trust Corp. will give Schwab access to very wealthy clients and give U.S. Trust access to more advanced technology, analysts said last week. "This is a swap – products and services for advanced technology," said Amy Butte, an analyst at New York-based Bear, Stearns & Co.

Intel's in the Black

Intel Corp. reported fourth-quarter revenue of $8.2 billion, up 8% from the fourth quarter of 1998. For the year, the company reported revenue of $29.4 billion, up 12% from 1998.

Intel said acquisition-related costs resulted in net income of $7.3 billion in 1999, up 21% from $6.1 billion in 1998.

Lufthansa Picks SAP

German airline Deutsche Lufthansa AG signed a contract to more than double its investment in SAP AG's business applications during the next three years. Financial details weren't disclosed, but the companies said the number of Lufthansa workers who use SAP's software is expected to increase from about 8,000 to more than 15,000.

Short Takes

CONSUMERS spent $7 billion online during this holiday shopping season, and 90% of 810 consumers surveyed reported high satisfaction with their online experience, according to a study by New York-based JUPITER COMMUNICATIONS INC. . . . ORACLE CORP. is supporting XML in its latest releases of Discoverer and Reports, 3i and 61, respectively.

EDS, Ariba To Offer Procurement Sites

Effort aims to lower costs with efficiencies

BY LEE COPELAND

ELECTRONIC DATA Systems Corp. subsidiary CoNext and Ariba Inc., plan to co-develop Web-based business-to-business procurement sites for big corporate customers, the firms said last week.

CoNext and Ariba want to create what they call Leveraged Sourcing Networks for more than 400 companies. The networks will offer a wide range of goods and services — from office supplies and computer systems to travel and energy services — for purchase and auction.

Greg Spray, the director of operations procurement at Hewlett-Packard Co. in Palo Alto, Calif., has been using Ariba's procurement network since last February. Spray said the system made transaction processing more efficient by using electronic forms and offering one spot for users to order goods.

"The other efficiencies are important, but the real upside is the environment of competition we're building with our supplies, and we expect that to translate into lower prices," Spray said.

Deal Makers

EDS has demonstrated that it can lower costs by driving efficiencies into many business processes and managing systems effectively, said Stan Lepeak, a vice president at Meta Group Inc. in Stamford, Conn. "Their consultants are better negotiators, and they know how to strike a good deal [with suppliers]."

EDS, Bethlehem Steel Corp., The Clorox Co., Kellogg Co. and eight other firms have signed on to participate in the first of 12 planned sourcing networks, with the first site launch slated for June. The next four networks — one each for companies in Asia, Europe and South America and a fourth for industry-specific procurements — are expected to open for orders later this year.

Ariba and EDS will charge registration and per-transaction fees to firms that buy goods through the network. Company officials declined to provide specifics.

Ariba operates an extensive online catalog of office supplies that will be tailored to meet the specific purchasing needs of each buying consortium. Participating buyers will install Ariba's software and electronic purchasing forms on their intranets and purchase supplies via a Web browser. The deal calls for EDS in Plano, Texas, and Ariba in Mountain View, Calif., to swap stock warrants. EDS could gain a stake in Ariba of up to 7.3% depending on the revenue stream generated from the procurement sites, while Ariba could gain a 5% stake in CoNext. ◗

Web-Based Buying Benefits

1. Offers an IT staff that's dedicated to maintaining purchasing systems
2. Streamlines purchasing costs by standardizing on one electronic form
3. Lowers the price of goods via volume purchasing
4. Eliminates the need to strike individual deals with suppliers

Insurer Bets on Intel Server

32-processor box to run Windows 2000

BY JAIKUMAR VIJAYAN

Penn National Insurance is the first U.S. customer to bet on Blue Bell, Pa.-based Unisys Corp.'s new 32-processor Intel Corp. server. The server will run Windows 2000 Data Center Edition, the companies said last week.

During the next 24 months, the insurer will use the mainframe-like ES7000 Intel server to consolidate applications currently running on more than 60 servers, said Tom Miele, director of infrastructure at Penn National in Harrisburg, Pa.

Penn National's current collection of servers includes Hewlett-Packard Co. Unix-based servers, Compaq Computer Corp. Windows NT-based servers and IBM mainframes.

The consolidation project is part of an effort by Penn National to enhance its electronic business capabilities.

The company will also roll out two new applications: a Web-based claims processing application for 1,200 independent agents and a policy administration system.

Penn National will take delivery of the Unisys ES7000 in June and then migrate applications in two stages. Many of the core applications scheduled to run under Windows 2000 on the new server will be tested on smaller four-way and eight-way systems before being put on the ES7000.

Cautious Approach

"We are taking a very cautious approach. . . . It is going to be some time before we put any production applications on Windows 2000," Miele said.

Penn National is an early example of a company trying to curb server proliferation by taking advantage of scalable, relatively inexpensive Intel servers and the central management capabilities promised by Windows 2000.

"Server consolidation is going to be a big story," said Joseph Ferlazzon, an analyst at Technology Business Research Inc. in Hampton, N.H.

The Unisys ES7000 — priced from $150,000 to more than $700,000 — can be partitioned into six smaller servers, allowing users to consolidate multiple applications within one box. ◗

Healtheon Allies with CVS

BY JULEKHA DASH

Internet health care company Healtheon/WebMD Corp. last week forged a five-year information technology and business partnership with the nation's largest retail drugstore chain, CVS Corp.

Healtheon will complete more than 50 million electronic pharmacy transactions for CVS over the next six months, and CVS.com will be the exclusive online pharmacy for Healtheon and its online partners. Financial terms weren't disclosed.

Woonsocket, R.I.-based CVS will upgrade telecommunications lines between itself and Atlanta-based Healtheon.

Healtheon will put up two frame-relay lines between the firms to handle the 36% increase in monthly pharmacy switching transactions that will result from the deal, said Connie Roebuck, a pharmacist at Healtheon. These transactions connect CVS pharmacies to insurers, pharmacy benefits managers and other health care institutions.

Healtheon/WebMD provides Internet-based information and transactions, health content and connectivity to almost 700 insurers.

Healtheon, which relies on Common Object Request Broker Architecture middleware, currently handles 23 million transactions per month. Tim Hohl, a spokesman for Seattle-based CVS.com, said one of the company's goals from the partnership will be to eventually conduct the entire prescription approval and payment process electronically. ◗

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Civil Liberties Groups Slam Encryption Export Rules

BY ANN HARRISON

Three civil liberties groups last week blasted the new encryption export regulations released by the U.S. Department of Commerce, charging that they still violate constitutional protections guaranteeing the free exchange of information and fall short of the Clinton administration's promise to deregulate technology that secures electronic communications.

The American Civil Liberties Union in New York, the Electronic Frontier Foundation (EFF) in San Francisco and the Washington-based Electronic Privacy Information Center (EPIC) said they will continue to push for the elimination of U.S. government regulations on Internet encryption technology.

The new rules, which took effect Jan. 14, allow the export of strong retail encryption products by lifting restrictions on encryption key length. Although past requirements for export licenses have been removed, such products will still require a one-time review by the Commerce Department, and the ban on sales of encryption products to seven nations accused of sponsoring terrorism is still in place.

EPIC general counsel David Sobel said U.S. government review inhibits the free exchange of encryption technology. "The revised rules will make it easier for commercial firms to export and sell encryption products," Sobel said. "While that is a positive development, the government will still retain significant control over this technology, to the detriment of efforts to create a truly secure Internet."

Officials at Network Associates Inc. are applauding the relaxation of restrictions. "I can see why the privacy rights groups have an issue, but from a business standpoint, the one-time technical review has already been in effect for 56-bit products and has not proved to be a burden," said Kelly Blough, director of government relations at the Santa Clara, Calif.-based firm, which exports encryption software.

Not Satisfied

Shari Steele, director of legal services at EFF, said the government has pursued a divide-and-conquer strategy, giving preferential export considerations to commercial entities in an effort to push their agendas. The constitutional watchdogs further noted that while the new regulations appear to permit free posting of encryption source code to Internet discussion lists, these postings may be illegal if the author has "reason to know" that they will be read by a person in one of the countries that are banned from receiving such material.

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CUT ALONG DOTTED LINE FOR AN INSTANT BOOKMARK. OR PUT IN YOUR WALLET. SO WHEN THE SUBJECT COMES UP AT ONE OF THOSE INDUSTRY SOIREES YOU CAN SHOW THE DISBELIEVERS THE REAL E-COMMERCE FACTS.

Oracle Beefs Up Database Security

BY ROBIN ROBINSON

Oracle Corp. last week unveiled two security features for its 8i Release 2 database aimed at businesses that conduct e-commerce.

A new data encryption feature was designed to protect information across the enterprise, from desktops to the central database. And the virtual private database feature that debuted in 8i can now manage very large databases with tens of thousands of simultaneous users, the software company said.

Chip Self, a regional programmer at First American Title Co., uses the version of the virtual private database currently available in Release 8.15 of 8i and plans on upgrading to 8.16 as soon as it's available for the Windows NT platform next month, he said.

Self, based in Winter Park, Fla., said he uses the security feature to allow 20 account-reporting locations to see one another's data but only alter their own information.

Harder to Hack

"In the past, you had to do that with [command-option] VIEWS, but this is extremely flexible," Self said. "And you can't hack around it. It goes all the way down to the basic levels of the Oracle database. The only way that you can override it is with SYSUSER [administrative authority]."

"I think application service providers will be excited," said Terilyn Palanca, an analyst at Cambridge, Mass.-based Giga Information Group Inc. "They don't want to put up a version of the Oracle database for each client using them. With [this] virtual private database, they can mix the data and not require [database administrators] to manage all this, like VIEWS. . . . It's a much better way to provide security."

Likewise, corporate database developers want data encryption across a company's infrastructure, not just within the network. "People know the Secure Sockets Layer encryption is in the wire, but they want it to go all the way to the actual storage of the data," Palanca said. "Oracle's done a lot of work in this area that I'm not sure the others have done."

Bob Shimp, senior director of product marketing for Oracle's Internet platform, said Release 2 is available now on a number of popular Unix versions and will be available on the Windows NT platform next month.

"A couple days ago, a guy in Eastern Europe broke into an e-commerce site and stole 300,000 credit-card numbers. With Oracle's data encryption, even if he got past all the other safeguards, all he would see is garbled information," Shimp said. "It's very difficult to decrypt this."

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Intel Technology Pushes Laptops to Desktop Speeds

But that alone won't spur PC replacement

BY DOMINIQUE DECKMYN

INTEL CORP. this week will unveil its SpeedStep technology, long touted as having the potential to narrow the performance gap between desktop machines and portables. But users and analysts say other issues — such as cost of ownership and durability — will keep them from abandoning desktop systems in droves.

"The theory has always been that notebooks would replace desktops," said Roger Kay, research manager at International Data Corp. in Framingham, Mass. But, he said, sales of notebooks as a percentage of total PC sales "have remained remarkably constant," mainly because of falling desktop prices and the performance gap.

SpeedStep lets a laptop run at near-desktop speeds when it's powered by electricity but lowers both the voltage and the clock speed of the processor when running on batteries. It will be included in mobile Pentium III chips that Intel is expected to introduce tomorrow.

The fastest will run at 650 MHz but will switch down to 500 MHz when working on its battery, though one analyst said she doubted users would be able to tell the difference. The second will run at 500/600 MHz, sources confirmed. Intel wouldn't discuss unannounced products.

Ken Dulaney, an analyst at Gartner Group Inc. in Stamford, Conn., said the speed boost is "not dramatic," but still called it "a necessity" for some demanding users. Users, however, say clock speed isn't the main factor that's keeping them from rolling out more notebooks.

"The total cost of ownership [for notebooks] is much higher," than for PCs, said Pamela Summers, manager of workstation technology at Nabisco Inc. in Parsippany, N.J. Price, size and weight are Nabisco's main criteria when choosing a laptop model. About half of Nabisco's computers are notebooks, and that percentage is set to remain stable or fall slightly.

In fact, some notebooks for mobile workers are being replaced by handheld computers and pen pads, said Summers.

Mike Rakestrow, information systems director at Ironwood Lithographers Inc. in Tempe, Ariz., said his main concern with notebooks has been about durability and reliability, not performance. "A good percentage of our people have lost data" due to laptop malfunctions, Rakestrow said. ◗

Desktop Replacement?

Despite years of talk about replacing desktop machines with portables, sales of portables as a percentage of total PC sales have been constant.

Estimated portable sales as a percentage of total U.S. PC sales:

1999	2000
17.7%	17.0%

INTERNATIONAL DATA CORP., FRAMINGHAM, MASS

Compaq to Ship iPaq With Management Software Agent

Offers 'drop-dead' simplicity for IT

BY MATT HAMBLEN

Compaq Computer Corp. will ship its first $499 iPaq desktop computers at the end of the month. They will be equipped with Windows 2000 and a new automatic PC management software agent.

Houston-based Compaq officials told *Computerworld* last week that the management software from Altiris Inc. in Lindon, Utah, will cut $124 off the average $226 PC setup and deployment cost because it automates the process.

The Altiris deal will be announced officially next Monday, and the software agent will be included in iPaq machines that are also Windows 2000-ready, even though the new operating system won't officially be introduced until Feb. 17, said Compaq vice president Ray Frigo.

The combination of the management software with the iPaq "could be a great concept" in terms of keeping total cost of ownership down, especially in large companies where PC rollouts are in the thousands, said analyst Rob Enderle at Giga Information Group Inc. in Santa Clara, Calif.

IPaq is built on a more stable architecture that should require less maintenance, and the automatic distribution of software would allow quick repairs, Enderle said. "If one crashes, you could have all your files and applications on a server and just replace the machine and flash out a new software imprint," he said. "It's drop-dead simple."

IPaq, announced in November, has a shape that is different from most PCs and a sleek design in black and silver, but it's mostly important for its "legacy-free" components, meaning it comes without a serial or parallel port or a Peripheral Component Interconnect expansion bus. It uses five Universal Serial Bus (USB) slots instead.

Thousands of iPaqs have been ordered directly over the Internet, said Jerry Meerkatz, vice president at Compaq's Internet Access division.

James Fecteau, director of information technology at Eagle River Associates in Kirkland, Wash., said an iPaq with a 500-MHz Celeron processor would be perfect for the typical office user, but he worried that USB isn't widely used enough yet. ◗

IBM Promises Increased Support for Linux

BY JAIKUMAR VIJAYAN

IBM's pledge to increase support for Linux should boost corporate confidence in the open-source Unix variant, said analysts and users.

IBM last week said it will substantially expand its use and marketing of the Linux operating system across its entire range of server hardware.

A core focus will be on improving interoperability between Linux and other operating systems supported by IBM, such as OS/390, OS/400, AIX and Windows NT, said the executive in charge of the Linux initiative, Irving Wladawsky-Berger, who was formerly the general manager of IBM's Internet business.

IBM also pledged to build support into Linux for clustering, symmetrical multiprocessing (SMP) and systems management technologies. Any enhancements to the operating system will be made available to the open-source community from which Linux evolved, Wladawsky-Berger said.

Moves such as these should help make Linux more palatable to information technology organizations attracted to the interoperability and ease of use of the operating system but who are holding back because of service and support concerns. "Anytime you have a tier-one vendor making these sorts of pronouncements, it can only help" justify the use of Linux for corporate applications, said Jeff Davis, a senior systems programmer at Amerada Hess Corp. in Houston. The petroleum company uses Linux for applications such as file serving, Web serving and e-mail.

Growing support by most of the other major systems makers, including Sun Microsystems Inc., Hewlett-Packard Co. and Compaq Computer Corp., "will certainly speed up the acceptance of Linux as a serious alternative to Windows 2000 and to some Unix" versions, predicted Bill Claybrook, an analyst at Aberdeen Group Inc. in Boston.

Linux shipments last year grew faster than the 26% predicted by International Data Corp. (IDC), according to preliminary 1999 estimates from the Framingham, Mass., company. Linux accounted for just under 16% of the 4.4 million server operating system copies sold in 1998, IDC said.

The popularity of Linux, particularly for smaller applications, is another factor that makes it important for vendors such as IBM to support it more fully, said Rich Partridge, an analyst at D. H. Brown Associates Inc. in Port Chester, N.Y.

IBM already supports Linux in a numbers of ways. For instance, Linux is available on some models of its RS/6000 Unix servers, and IBM has released source code modifications that enable Linux to run on its S/390 mainframes. Similarly, Linux support on the AS/400 platform extends file serving and print services to Linux clients. ◗

JUST THE FACTS

IBM's Linux Initiative Will:

- Focus on improving interoperability between Linux and AIX, OS/390, OS/400 and Windows NT
- Provide Linux support across all of its hardware lines
- Integrate support for SMP, clustering and system management technologies
- Set up a team of 200 Linux developers

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Novell Grabs for ASP Ring

Details to come later, but acquisition of file-management business part of plan

BY DAVID ORENSTEIN

NOVELL INC. last week said it wants to become an application service provider, but it won't provide detailed plans until later this year.

"We're going to announce our ASP strategy later in the year," said Novell spokesman Jonathan Cohen. But he said Novell acquired JustOn Inc.'s Web-based file-management business in Palo Alto, Calif., last week to build up the portfolio of technologies required to enter the application service provider marketplace as a supplier and a direct participant.

An application service provider remotely hosts the applications and data used by a client company.

"We're looking at both opportunities: to provide the services for consumers and businesses and to also make technology available to ASPs, including our partners," Cohen said. "We want to do both."

Terms of the JustOn acquisition weren't disclosed, and the deal isn't final. JustOn allows users to store and share files at a secure Web site using any Web-connected device.

Novell's most likely offerings as an application service provider would be network management services based on its directory, file-management and security software, said Lew Hollerbach, an analyst at Aberdeen Group Inc. in Boston. He noted that Computer Associates International Inc. in Islandia, N.Y., and Acer Inc. in Taiwan announced an application service provider joint venture in December.

Without details about Novell's plans, users were reluctant to comment, but they said their high regard for Novell's products would compel them to watch for those details.

Novell's customer service has always been very good, and it could be a good application service provider too, said Alex Beaube, a network administrator at SouthTrust Bank NA. "It has been a very good working relationship with them," he said. However, Beaube said the Birmingham, Ala.-based bank isn't looking at outsourcing information technology.

Similarly, National Public Radio in Washington isn't looking for an application service provider, but it respects Novell's technology and service enough to want to stay tuned, said Rodney Armstrong, manager of technical operations. The organization is rolling out NetWare 5.0 and, later, 5.1 to better manage its Windows NT network.

Novell's desire to extend its capabilities is understandable, said Jamie Lewis, CEO of The Burton Group in Midvale, Utah. But Novell will face the same challenge as vendors such as Oracle Corp., which is trying to sell products to application service providers while competing with them. ◗

MOREONLINE

For resources on application service providers, visit our Web site.
www.computerworld.com/more

ASP Deals Target Exchange Management

Scalability possible issue for outsourcers

BY LEE COPELAND

Microsoft Corp. last week announced deals that will allow users to outsource the management of Exchange groupware and messaging, but analysts say scalability may be a challenge.

Microsoft said application service providers such as Electronic Data Systems Corp. and Hewlett-Packard Co. will let users rent Exchange 5.5 and, later, Exchange 2000.

Microsoft and its application service providers are targeting resource-constrained small to midsize businesses and large companies that are "stalled in deployment or upgrades," a Microsoft official said.

David Ferris, president of Ferris Research Inc. in San Francisco, said outsourced messaging is in demand, but Exchange's low seats-per-server ratio may increase costs.

"There are lots of people that have Exchange that want to outsource it, and demand from [information technology organizations] will encourage more outsourcers to host it," he said.

But for outsourcers, "if they want a messaging product that scales, Exchange would not be the product of choice," he said.

Individual application service providers determine pricing per mailbox, as well as installation and management fees, Microsoft officials said.

USinternetworking Inc. in Annapolis, Md., is one of Microsoft's application service providers. It has four customers that range from 100 to 1,200 seats renting Exchange, said Nick Magliato, president of enterprise messaging. Pricing averages about $25 per month per user, based on 1,000 users.

Microsoft recently started rolling out its hosted applications initiative. In November, it launched Microsoft Office Online, which lets users rent the Office software suite. In October, it teamed with Cisco Systems Inc. to offer tools and services to application service providers. ◗

Oracle Upgrades Web Tool

BY ROBIN ROBINSON

Business Objects SA in San Jose followed its customers' lead this month by offering an extranet version of WebIntelligence. Last year, some customers running the client/server version altered and deployed it on an extranet.

Owens & Minor Inc., a medical supplies distributor in Richmond, Va., uses the client/server and extranet versions of WebIntelligence, an integrated query, reporting and online analytical processing tool for the Web. It has used the tool since 1996, said Don Stoller, director of information management at Owens & Minor.

The company's extranet, called WISDOM, won a Best Practices award last year from the Data Warehousing Institute. WISDOM, which stands for Web Intelligence Supporting Decisions from Owens & Minor, connects the company with suppliers and hospitals.

Owens & Minor was one of the 100-plus customers that adapted the client/server version of WebIntelligence to work in an extranet environment, said Timo Elliott, senior director of extranet marketing at Business Objects.

"They built a nice tool," Stoller said of the client/server version, "but when it comes to the extranet, you need to be in a position to manage and deploy to your customers and suppliers over the Web. We've already done that using the WebIntelligence software, and we want to make sure that they continue to support it."

Owens & Minor didn't replace one version of WebIntelligence with another, he added. "There's still tremendous functionality [in the full-client version] that's not yet with the Web version," Stoller said. "We liked the hybrid approach, where one can continue to communicate with the other." ◗

Cognos App Bridges Client/Server and Web

Release scheduled to ship this week

BY ROBIN ROBINSON

Ottawa-based Cognos Inc.'s latest release of its analysis tool, to be shipped this week, blurs the line between its client/server and Web versions, says a user who has been running the beta release.

Malcolm Fowler, vice president of business development at Ernex Marketing Technologies Inc. in Burnaby, British Columbia, said he has been running PowerPlay 6.6 for internal employees on a Windows NT client/server platform. Customers performing analysis via the Internet also use it.

Ernex handles electronic point-of-sale marketing for retailing clients. In the past year, the company has offered demographic information on its site for business analysis. Previously, some functions and reports created in PowerPlay's client/server version weren't available in the Web version.

MALCOLM FOWLER at Ernex says, "Everything inside the system is more fluid"

"Everything inside the system is more fluid," he said. "They're starting to blend. It sounds easy, but those things are not easy."

Ernex decided two years ago to use PowerPlay.

"We're an Internet business. We collect our information over the Internet, and we had a vision that we wanted to deliver back to the customer electronically," Fowler said.

"With Cognos, when [information is] pushed out to the people, it has a more sophisticated look and feel and is user-oriented." ◗

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BRIEFS

Toys R Us Sued

Attorneys in Seattle have filed a class-action lawsuit on behalf of customers of Paramus, N.J.-based Toysrus.com who didn't receive their orders in time for Christmas. In compensation, the company had offered to give $100 gift certificates to shoppers who spent the holiday without the toys they had ordered. The suit cites breach of guarantee and consumer protection statutes.

Ethernet for Outdoors

Cabletron Systems Inc. in Rochester, N.H., said last week it would offer an outdoor version of its RoamAbout wireless Ethernet system. The company said the system augments its in-building wireless Ethernet scheme and provides point-to-point connection between buildings up to 3.5 miles apart, at speeds of up to 11M bit/sec. Equipment needed to connect two facilities is priced at $3,400.

J. D. Edwards Deal

J. D. Edwards & Co. in Denver announced a deal in which it will invest in Extensity Inc. in Emeryville, Calif. It will resell Extensity's travel and expense-management software. The agreement continues J. D. Edwards' strategy of filling holes in its line-of-business applications by reselling products instead of developing its own.

Support App for Picazo

Picazo Communications Inc. in San Jose last week announced the purchase of Compaq Computer Corp.'s NetACD (automatic call distributor) software. NetACD enables live-agent customer support via the Internet. Picazo said it will market NetACD to e-commerce call centers and companies such as banks that intend to offer online customer service.

Short Takes

VIRAGE INC. in San Mateo, Calif., has announced that the Web site for *The New York Times* is using Virage products to add video search capability. . . . Music copyright organization BMI in New York has announced the creation of the BMI Digital Licensing Center, a digital music copyright licensing system for Internet sites.

Continued from page 1

Build or Buy?

tions down the road.

Packages from Redwood City, Calif.-based BroadVision Inc., IBM, San Francisco-based Intershop Communications Inc., New York-based InterWorld Corp. and Burlington, Mass.-based Open Market can help with everything from setting up storefronts and catalogs to payment and transaction processing.

And the suites have improved considerably in the areas of content management, personalization, dynamic pricing and the handling of multiple orders and large numbers of items, analysts said.

"Even today, you're seeing many of the largest companies reconsidering their internally developed software because it's not just an issue of how much it costs to deliver. Eighty percent of the cost of software is in maintenance," said Paul Scarpa, an analyst at The Yankee Group in Boston.

Yet Scarpa said he recognizes that approach may not make sense for established online retailers, such as CDNow Inc. in Fort Washington, Pa., which have experienced staffs maintaining well-tuned proprietary code that gives them flexibility to change site features quickly.

Using its own resources "allowed us to grow at a phenomenal rate and [has] given us control over our own destiny," said CDNow Chief Development Officer Michael Krupit. Krupit said his company recently used packaged software from Mount Laurel, N.J.-based Bluestone Software Inc. to create its new Cosmic Music Network. "We found it costs just as much to integrate third-party technology as to build upon our own proprietary platform," he said.

CDNow has opted for specialized packages only in targeted areas such as search technology, personalization and customer management.

Full e-commerce suites "dictate an architecture" that the company must design to, and "you end up paying a lot of money for technology that isn't tailored to your development environment or site needs," Krupit said.

"I think the suites are still at an embarrassingly early stage, given how long they've been out there," said consultant David Strom at David Strom Inc. in Port Washington, N.Y. "There's still a fair amount of programming you have to do, even if you buy a suite."

Although packaged e-commerce suites may need to improve, many analysts recommend that companies check them out — particularly those that are just getting started. They also caution firms to do a careful needs assessment before making a commitment.

Rather than take a build-your-own approach, Britannica.com is scoping out packages to help customize its site because it doesn't want to do the hard coding itself, said John Hoffman, director of business applications at the Chicago-based company. A spokesman for Open Market said the products Britannica uses weren't designed for content management, adding that a content tool is being enhanced.

VitaminShoppe.com found that its Microsoft system didn't have "enough robustness," so it's turning to "best-of-breed" products to help with customer profiling and personalized marketing, said CEO Kathryn Creech.

But for sites with limited expectations and budgets, a suite may suffice. Steven Little, CEO of The Queensboro Shirt Co. in Wilmington, N.C., said his company chose IBM's Net.Commerce and is turning a profit after spending about $125,000 to get started, with the help of an outside development firm, Cephas.com in Lenexa, Kan. "You can't do everything," Little said. ◗

Continued from page 1

AOL Deal

Boston-based Web development firm that has done work for National Public Radio and other organizations, agreed. "Web developers [will] have to develop more and better features for higher and higher speeds," Lix said. "If companies are smart, they are already moving in that direction. If not, now they have to move in that direction."

Some retailers have been eager to add better graphics, streaming video, 3-D interactivity and other data-intensive options that would give shoppers a better sense of products for sale.

However, such features could add lengthy page-download delays for consumers on dial-up modems, and the expense of developing features has to be justified by a critical mass of users with high-speed access.

JCrew.com in Lynchburg, Va., has already been thinking about providing Web site content for broadband, according to Scott Gilbertson, president of e-commerce at the retailer.

"We have several capabilities on hand that we could roll out with broadband, which would enhance our customers' user experience and optimize sales productivity," said Gilbertson. "However, we do not want to dilute the experience of the majority of customers without access. We have the flexibility to offer one site for broadband and one for PC modems."

The buyout will have tremendous implications for marketers and merchants currently developing traditional Web sites — if and when it leads to more widely available broadband access, said David Fry, director of Fry Multimedia Inc. in Ann Arbor, Mich., a company that designs Web sites for firms such as Eddie Bauer Inc.

But Glen Lipka, a founding partner of Kokopelli New Media LLC in New York, said he doesn't think Web site developers have to rush to change the way they do things.

"It will take years for broadband to propagate," Lipka predicted. ◗

America Online History

1/91 AOL announces $350B buyout of Time Warner

AOL market cap: $152B*

3/98 AOL acquires Netscape for $4.2B

12/99 AOL announces it will be added to the S&P 500-stock index

Market cap: $72B**

12/96 AOL introduces unlimited-use pricing plan of $19.95 per month

3/92 AOL goes public on the Nasdaq market

IPO share price: $11.50

10/91 Quantum Computer Services (founded 1985) changes name to America Online Inc.

SOURCE: AOL
*SOURCE: DOW JONES & CO.
** SOURCE: THE GLOBE & MAIL

Teens Crack PacBell ISP

BY ANN HARRISON

A group of teen-age computer crackers allegedly used thousands of stolen Internet accounts to probe the networks of two national nuclear weapons laboratories, according to law enforcement authorities in California last week.

At least five crackers, between the ages of 15 and 17, compromised accounts at 17 Internet service providers in the U.S., Romania and Australia. They used the accounts to attack nine targets, including the Sandia and Oak Ridge National Laboratories and Harvard University, according to Capt. Jan Hoganson of the Sacramento Valley High-Tech Crimes Task Force in California.

Hoganson said the crackers managed to gain root access to computers at Harvard, but just scanned the national lab networks to look for vulnerabilities. The intruders stole 200,000 accounts alone from San Francisco-based Pacific Bell Internet Services for use in the attack.

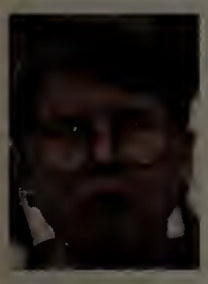
According to Hoganson, the stolen accounts were used to scan for open network ports at the labs that could be used for subsequent attacks. Hoganson emphasized that the laboratory networks themselves weren't compromised. ◗

Reno Calls for Network Targeting Net Crime

BY MARK HALL
STANFORD, CALIF.

Adding her voice to those who say more can be done to stop crime on the Internet, U.S. Attorney General Janet Reno last week proposed a program designed to coordinate anticybercrime efforts among individual states and even nations. Called "LawNet," the program would be available 24 hours per day, seven days per week.

While acknowledging that the Internet is a "force that brings us together" and "has changed the world forever," in her speech before the National Association of Attorneys General here, Reno was preoccupied with what she called "the dark side of the Internet," such as child pornography, terrorism, stalking and extortion.



RENO advocates setting jurisdictional guidelines

"The Internet provides a larger number and more accessible victims," she said.

Possible Benefits

Among the benefits of her LawNet proposal would be addressing the issue of jurisdiction of a crime, Reno said. For example, she said, tracing the location of a stalker may take investigators through a byzantine series of anonymous remailers across states and sometimes continents. Such investigations can involve different laws and customs that could affect everything from issuing subpoenas to extradition. By establishing guidelines in advance through LawNet, Reno argued, jurisdictional bottlenecks could be avoided and criminals brought to justice more quickly.

Although the Internet has contributed to the "globalization of crime," Reno said, "cybercriminals should get the clear message that there's no safe place to hide."

California Attorney General Bill Lockyear said that while Reno's call for LawNet is a step in the right direction, he worries that centralized approaches risk "smothering new technologies and e-commerce." He also said there has been significant progress combating crime at the local and state levels.

Attorney General Jim Doyle of Wisconsin called Reno's proposal "a good plan." But he agreed with Lockyear that state officials haven't been standing by waiting for the federal government to take action.

Doyle and Lockyear also expressed concerns about where the funds would come from to underwrite Reno's proposal.

Kaye Caldwell, California policy director for the Internet Alliance, an Internet industry advocacy group in Washington, said Reno's proposal could be beneficial because it would provide a level of consistency, particularly in defining what constitutes consumer fraud or privacy violations. "Still, the details need to be gone through," she said.

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Merged Railroads Still Plagued by IT Snafus

Botched systems integration to blame for misrouted trains, scheduling mistakes

BY KIM S. NASH

THIS IS THE STORY OF HOW two railroads merged, botched the integration of their computer systems and, seven months later, are still losing millions of dollars worth of business.

Things are getting better at Norfolk Southern Corp. since the June acquisition of most of Consolidated Rail Corp. (Conrail). But freight trains are still misrouted, crews are still misscheduled, and customers are still temporarily losing their products somewhere on 21,600 miles of track.

Henry Wolf, chief financial officer at Norfolk Southern, acknowledged in an interview that some problems continue and that they are still pinching the company financially. Wolf, who oversees information technology, insisted that most of the technology glitches have been fixed and that others will be in the course of this year.

It wasn't as if the companies failed to plan.

The deal was complicated. Norfolk Southern, in Norfolk, Va., would get 58% of Philadelphia-based Conrail, and CSX Corp. the other 42%. Each company would exclusively own different sections of Conrail track, but they would also share routes in some regions.

Norfolk Southern and CSX were each responsible for meshing their respective IT systems with Conrail's. Both companies had problems after the merger, but Norfolk Southern's were bigger and more costly, according to rail industry experts.

Early in 1997, Norfolk Southern's IT staff started to look for commonalities with Conrail's systems. There were few, mainly because both railroads used text-based mainframe software they had built themselves. Norfolk Southern decided to build middleware to bridge the gap and spent more than a year on coding and testing.

Executives met regularly to mark progress and set goals. Everyone did what management gurus advise.

But looking back, Wolf said, insufficient training, programming errors and mysterious data-quality glitches — sometimes information disappeared or prior data reappeared — all but wiped out the delicate logistics of running a railroad on time.

The Domino Effect

It started with an unfortunate human mistake on go-live day, June 1. Instead of actual details about train loads and itineraries, a tape of old data originally used in testing was loaded into the system.

That initial goof was corrected within 12 hours, but Norfolk Southern couldn't recover; a spiral of other mishaps had already begun.

"As we started to experience some data problems, we ascribed them to the bad data dump," Wolf explained.

Norfolk Southern, which calls itself "the thoroughbred of transportation," issued a press release June 2 patting itself on the back for the merger.

The company figured everything would smooth out as clean data circulated through the system. "That was a wrong conclusion," Wolf said.

Instead, the system generated faulty waybills — the instructions on where and when to move individual train cars.

As a result, full train cars sat idle in increasingly congested yards, awaiting crews. Some loads ping-ponged between terminals without being emptied, while empty cars were moved along unfilled.

Last month, railcars blocked a train crossing in Ohio, forcing firefighters to crawl under them to get to a fire and children to scuttle under them to get to school, said Rex Damschroder, an Ohio state representative.

During that same three-hour block, an ambulance driver had to take a 21-mile detour around the congested crossing to get to an accident victim, Damschroder said.

Meanwhile, the average train speed dropped this summer from more than 20 mph to 16.7 mph.

It may seem like a small dip, but for railroads, such a slowdown means big trouble. As velocity slows, train cars build up. As train cars build up, velocity slows even more.

Meanwhile, crews worked longer hours and, by law, had to be replaced with fresh workers. One of Norfolk

RAILROAD BOTTLENECKS have created myriad problems in the Midwest, including blocked paths for emergency vehicles and missing customer freight

THE ASSOCIATED PRESS

Chugging Away

Train speed, shipment tracing and idle time have improved in fits and starts on Norfolk Southern's shared tracks. One issue — crew delays — continues to be a problem.

	NUMBER OF HOURS TRAINS WERE DELAYED WHILE AWAITING CREWS	NUMBER OF TRAINS AFFECTED
July 3, 1999 - July 30, 1999*	2,869	121
July 31, 1999 - Aug. 27, 1999	780	71
Aug. 28, 1999 - Sept. 24, 1999	656	60
Sept. 25, 1999 - Oct. 29, 1999	980	69
Oct. 30, 1999 - Nov. 26, 1999	940	82
Nov. 27, 1999 - Dec. 31, 1999	1,746	114

*Data for July 1 and July 2 unavailable

SOURCE: SURFACE TRANSPORTATION BOARD, WASHINGTON

Southern's biggest problems, which continues today, is ready-to-go trains waiting for crews (see chart).

The situation hit the railroad's customers right away.

United Parcel Service of America Inc. and others yanked their goods off the tracks in favor of trucks. (UPS has since returned most, but not all, of its business.)

In June, right after the merger, Norfolk Southern lost more than $40 million worth of business to trucking companies and other railroads. On top of that, Norfolk Southern spent $29 million that month on alternate transportation for major customers with which it had service-level contracts.

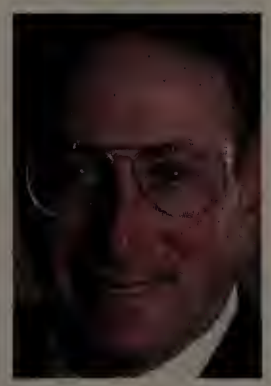
In its most recent quarter, ended Sept. 30, it lost another $73 million in business, and profits dropped 88%. The company has also spent $49 million since July on bonuses to coax employees to work overtime.

That's a big bill, but Wolf said it was unavoidable. "You have to satisfy customers that you have done everything humanly possible to meet their needs," he said. "Some suffered severe inconveniences."

For the chemical industry, which spends $4.8 billion per year on rail transportation, "the problems have not abated," said Tom Schick, an executive at the Chemical Manufacturers Association Inc., a trade group based in Arlington, Va.

For example, some chemical companies have had to slow production because there aren't enough trains to haul products on schedule, Schick said. He declined to name the firms.

> You have to satisfy customers that you have done everything humanly possible to meet their needs.
>
> HENRY WOLF, CFO, NORFOLK SOUTHERN CORP.



During the height of the chaos last summer, he said, chlorine for water treatment nearly didn't make it on time to several East Coast cities but for "extraordinary efforts" by both chemical makers and Norfolk Southern. They had to put extra trains on tracks and reroute crews, which, in turn, delayed other customers' shipments.

"This created a lot of anxiety," he said. "Imagine if Philadelphia or New York didn't have clean water to drink."

The Surface Transportation Board (STB), a federal agency that oversees rail mergers, has closely monitored the tumult. It already had been blindsided by the disastrous merger of Union Pacific Corp. and Southern Pacific Rail Corp. in 1996.

Soon after trouble from the Conrail deal emerged, the STB told Norfolk Southern and CSX to report exactly how many trains were affected and why, as well as other weekly metrics. But it hasn't insisted that any specific fixes be implemented.

The STB acts mainly as a conduit for shippers' complaints, a board spokesman said. "We're still receiving reports. This part of the merger is still unwinding," he said.

"It still mystifies me," said Ed Rastatter, director of policy at the National Industrial Transportation League, a major shippers group in Washington. "We insisted they fully test and plan the integration of the computer systems," Rastatter said. "They assured us in May [1999] they were ready, that they had tested seven ways to Sunday."

Wolf acknowledged that, in hindsight, testing and training fell short. For example, tests were conducted with pristine data, so no one knew how to respond or how the system would react if mistakes were entered, he said.

Attitude Adjustment

Arrogance, according to some critics, helped create the computer systems problems.

While trucking firms don't own highways and airlines don't own air, railroads own and control large sections of track. It isn't unusual to find miles of country serviced by a sole rail line.

Railroad companies "have done things a certain way for a long period of time and been protected from having to compete with each other so much that they've never had to deal with information [processing] in another, more efficient way," said Diane Duff, executive director of the Alliance for Rail Competition, a lobbying group in Washington.

"Microsoft has argued they're not a monopoly because even though they have 90% market control, there's 10% out there. The railroad industry is not much different," Duff said.

She suggested that the railroads would be better at customer service if they used global positioning systems to keep track of their railcars and if they learned some lessons in logistics from the airlines and companies such as Federal Express Corp.

For its part, Norfolk Southern is counting on new client/server software, dubbed the Thoroughbred Yard Enterprise System (TYES), that it developed in-house. TYES should fix many of the lingering problems, especially data-entry errors, Wolf said.

Rather than having to type in words and numbers to route train cars, for example, TYES users can click on prefabricated menu choices.

The company finished installing it on its part of the old Conrail tracks last month, cutting its original deployment schedule from 30 weeks to 18. The rest of Norfolk Southern should get TYES by the end of the year, Wolf said.

Rastatter said shippers appreciate Norfolk Southern's hard work to mend the situation, but they're frustrated.

"It's like poking a balloon in one place: It gets bigger somewhere else," he said. "Fixing a particular problem in a particular place may cause problems elsewhere."

Railroad Spin-off Offers IT Services

Despite its recent embarrassing and costly IT problems, Norfolk Southern has spun out a subsidiary that plans to sell technology services to other companies.

Formed in October, Thoroughbred Technology and Telecommunications Inc. sees two markets: telecommunications companies and other railroads.

First, the Norfolk, Va.-based company plans to offer cable and fiber-optic services along its 21,600 miles of railroad tracks in 22 states. It will resell its cable and fiber capacity to telecommunications companies such as AT&T Corp. and Sprint Corp.

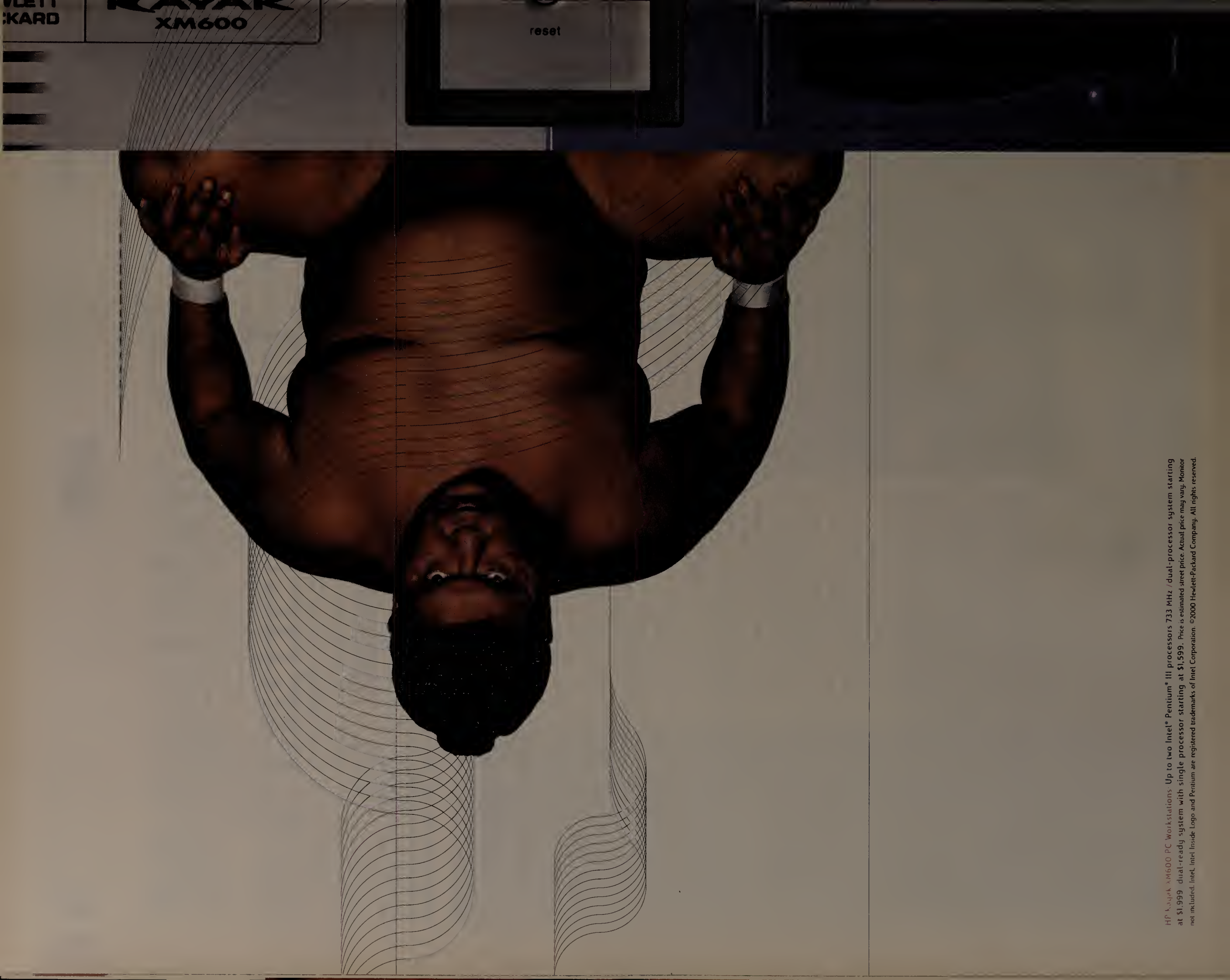
Another plan is to sell or lease space on its 400 towers to wireless companies. Norfolk Southern now uses the towers for an internal microwave network. Fast-growing wireless carriers are urgently seeking high, open areas – away from residential locations – to put antennae.

"We already have ongoing discussions with constituents of all of these groups, and I hope and expect that we will be announcing deals . . . shortly," said Charles Moorman, president of Thoroughbred, in an October speech to Wall Street analysts.

Second, Thoroughbred will try to sell its transportation software to other railroads. Canadian Pacific Railway Co. has already signed up, Moorman said in his speech.

But customers will likely question Norfolk Southern closely about its ability to deliver on technology promises after its Conrail computer troubles. "Absolutely, they will hear that question," said Tony Hatch, an independent railroad analyst in New York.

But, Hatch added, "they have every chance of success, because my guess is they will hire people who know how to do telecom." – *Kim S. Nash*



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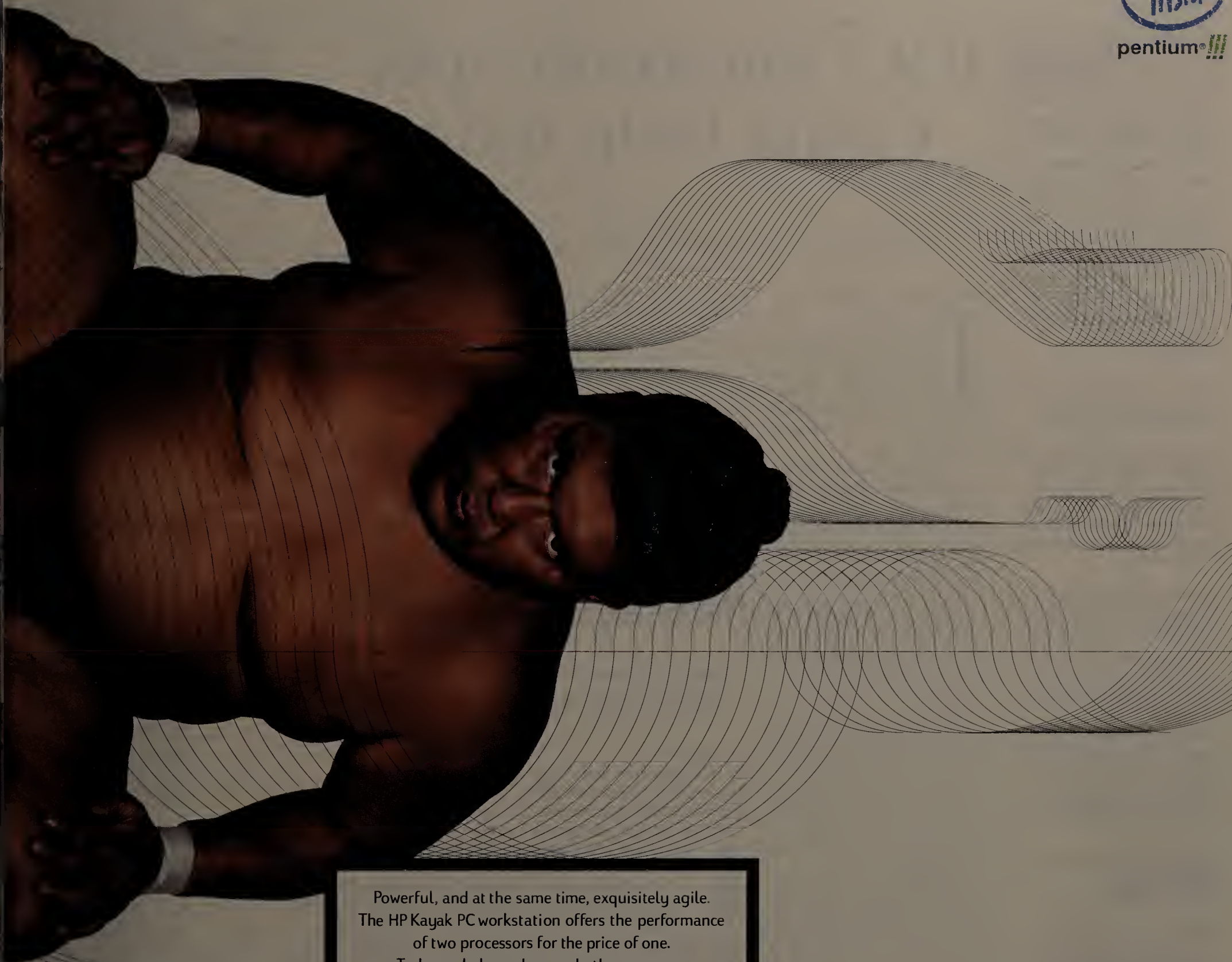

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BRIEFS

Xerox Heads to Court

The U.S. Patent and Trademark Office has confirmed the validity of a Xerox Corp. software patent, clearing the way for the Stamford, Conn.-based company to pursue a patent infringement case against Santa Clara, Calif.-based 3Com Corp. The lawsuit alleges that the handwriting-recognition software used in 3Com's Palm devices belongs to Xerox.

Ex-Baan CEO Hired

Just a week after quitting her job as CEO of Netherlands-based Baan Co., Mary Coleman surfaced as a managing director at Internet Capital Group Inc. in Wayne, Pa. Coleman will work in the company's San Francisco office.

Seagate Profits Slide

Falling prices in the disk-drive business hit Seagate Technology Inc., which posted $30 million in profits for the period ended Dec. 31, compared with $104 million in the same period a year earlier. Including one-time charges, the Scotts Valley, Calif.-based company reported that it lost $35 million on sales of $1.6 billion.

Short Takes

Austin, Texas-based VIGNETTE CORP. is purchasing DATASAGE INC. in Reading, Mass., in a stock swap worth about $595 million. DataSage analyzes real-time purchase and click-stream data. Vignette profiles customers and provides other information for online relationship marketing. . . . The SAGE GROUP PLC, a U.K.-based accounting software vendor, said it has signed a deal to buy BEST SOFTWARE INC. in Reston, Va., for $445 million in cash. Best Software makes Windows-based financial and human resources applications. . . . PRIMUS KNOWLEDGE SOLUTIONS INC., a Seattle-based e-commerce services and software provider, last week said it would merge with privately held 2ORDER.COM INC. in Atlanta in an all-stock deal valued at about $90 million. 2order.com, once known as BT SQUARED TECHNOLOGIES INC., provides software for personalizing sales over the Internet.

IDC: Microsoft Split Could Help Industry

Would reduce potential 'stranglehold' of Windows NT platform, analyst says

BY PATRICK THIBODEAU

INTERNATIONAL DATA Corp. (IDC) argued in a recently released report that Microsoft Corp. and the information technology industry as a whole would be better off if the company were broken up.

Microsoft offspring, divided along operating-system, application, tools and database lines, would then be free to offer products for other operating systems "and get away from the stranglehold of the [Windows] NT-only platform," said IDC analyst Tony Picardi, one of the authors of the report, which was prepared for clients of Framingham, Mass.-based IDC.

Microsoft's continued goal of selling comprehensive, Windows-specific packages to customers is "unrealistic," said Picardi. Offering Microsoft-only solutions "is the same thing as saying 'We're not going to trade with you unless you speak English.' "

Microsoft is fighting off the threat of a breakup in the antitrust case filed by 19 states and the U.S. Department of Justice. Government attorneys in the case have long favored structural relief — a remedy that doesn't require ongoing regulatory oversight. That has generally either meant a breakup or selling the source code for Windows.

One source close to the case said that while no agreement has been reached on just what to do, a consensus is emerging.

But Michael Geran, an analyst at the Pershing division of Donaldson, Lufkin & Jenrette Inc. in Jersey City, N.J., said a breakup of Microsoft might not necessarily be the better deal for investors.

In Microsoft's case, the premium commanded by the stock "in part reflects three things: the perceived financial strength and synergy between the pieces; the balance and forecastability of the earnings, which are important to institutional investors; and liquidity concerns," said Geran. "While people may argue that the parts are worth more than the whole, sometimes the marketplace doesn't work that way."

"A breakup remains a highly unlikely scenario," argued Hillard Sterling, an attorney at Gordon & Glickson PC in Chicago.

"Microsoft would never agree to a breakup in a settlement, and a breakup probably wouldn't survive the appellate process," said Sterling. "A breakup is an overblown reaction to the government's relatively narrow claims, [and] is totally unnecessary to enhance browser competition."

Microsoft spokesman Jim Cullinan said Redmond hadn't seen the IDC report, but Microsoft officials don't "believe that there's anything in this lawsuit that would result or dictate into such a harmful and severe resolution, like breaking up a successful company."

"I'm not sure what the rationale is behind this report," said Cullinan, "but this suggestion of breaking up the company is just not good for the company, the industry or consumers."

The New Microsoft?

IDC said the company could be divided up like this:

- Operating systems and middleware
- Tools and databases
- Applications
- Hardware devices
- Content and telecommunications

FEB. 22

Newbridge May See Uptick

Lands customer in a $200 million deal

BY JAMES COPE

An announcement that a U.S. firm would purchase $200 million in Digital Subscriber Line (DSL) provisioning equipment from Newbridge Networks Inc. may signal a financial uptick for the Ontario-based network equipment provider.

Analysts dinged Newbridge two months ago when it turned in lower-than-expected quarterly results. Newbridge's then-president, Alan Lutz, has since resigned.

But things may be looking up for Newbridge.

"This is probably the first significant deal in the DSL space for Newbridge, which could be a promising move for the company going forward," said James Slaby, a senior analyst at Giga Information Group Inc. in Cambridge, Mass.,

Newbridge said it would release third-quarter earnings results Feb. 22.

The $200 million sale was to DSL provider New Edge Networks in Vancouver, Wash. It purchased the Newbridge 350 Integrated Versatile Services Node platform, a single box installed at a telecommunications company's central office, to supply DSL services in a given market.

The equipment will facilitate New Edge's buildout of DSL in 1,500 sites across the U.S., according to the company's chief technology officer, Steve Hensley.

Hensley said his company's business plan drove the decision to use Newbridge equipment. "We wanted to do edge-to-edge provisioning on a single network platform," Hensley said. "We also needed to automate so we could connect to multiple devices."

He said New Edge looked at several vendors, but decided Newbridge offered the best single-box product after checking out the space where it would be installing the equipment and visiting the Newbridge laboratories.

"The 350 can do all kinds of things in a very dense platform," Hensley said. Competitive platforms became too unwieldy when frame relay and other capabilities were added, he noted.

Informix OKs SEC Order

BY ROBIN ROBINSON

The Securities and Exchange Commission settled an enforcement action against Informix Corp. last week but is continuing its investigation of individual officers at the company between 1994 and 1997, a lawyer for the SEC said.

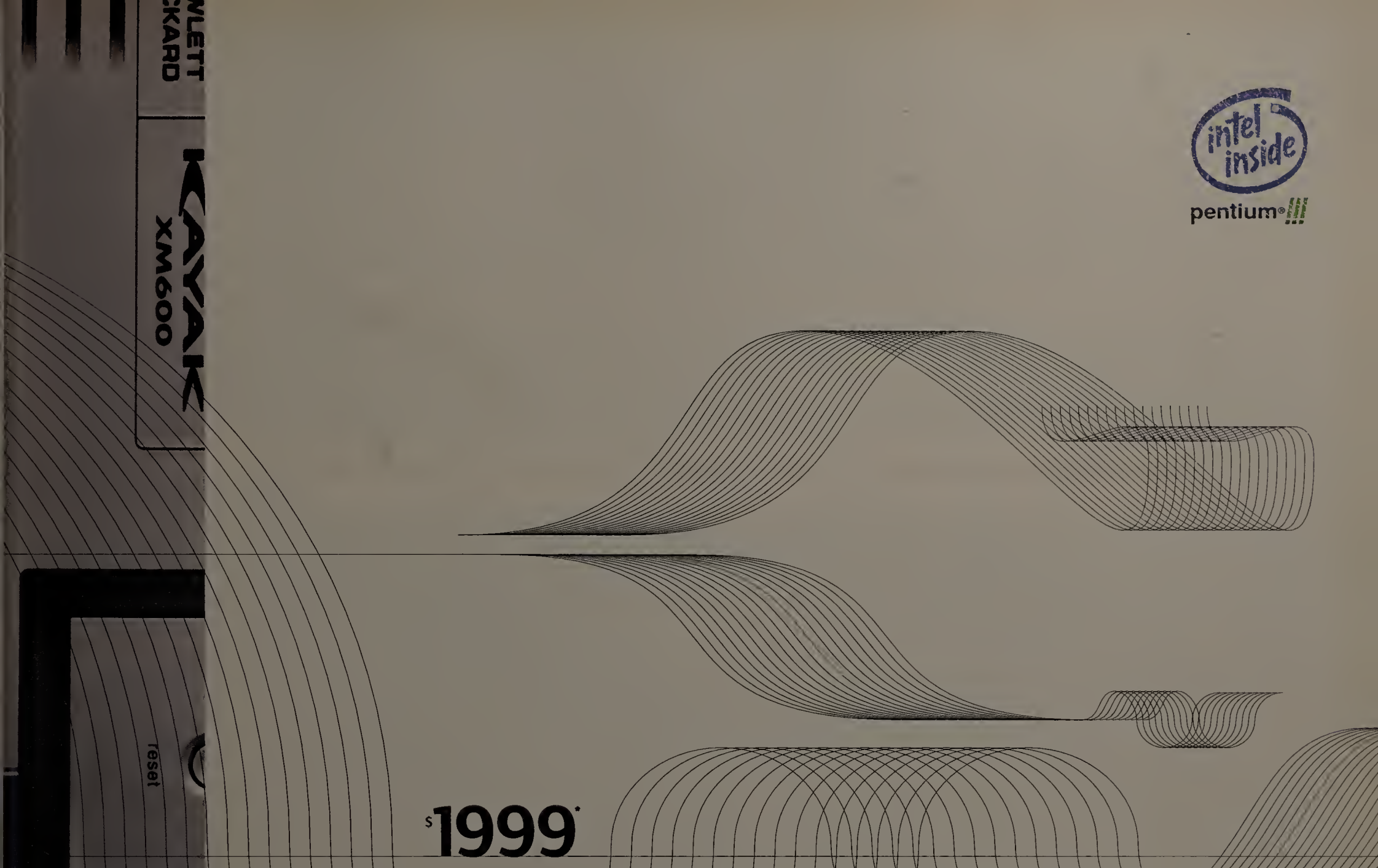
"Financial fraud investigations are our top priority, and even though much of the activity took place overseas, we have the ability to conduct investigations overseas," said Thomas C. Newkirk, associate director of the SEC's division of enforcement.

The Menlo Park, Calif., database developer had been charged with inflating revenue by $295 million and earnings by $244 million from 1994 to the first quarter of 1997.

The SEC said former Informix employees had violated various securities law provisions. The commission also said Informix made false and misleading filings during the three-year period covered by the order.

"The investigation is continuing with respect to the possible misconduct of other individuals and firms," Newkirk said. Informix consented to the order without admitting or denying the SEC's findings.

Informix officials couldn't be reached for comment.



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Chris Dressler, Senior Program Manager, **NORDSTROMshoes.com**

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To find out how Chris and his team built NORDSTROMshoes.com and

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Where do you want to go today?®

MARK HALL

You've got problems

OR YOU SOON WILL. America Online's acquisition of Time Warner has the potential to create a load of headaches for you. No, not because it means AOL will double your weekly allotment of disks and CDs hawking free online hours, although that is a distinct possibility. The big pain will be competing with Web sites that will be delivering media-rich content to your company's potential customers.

These Web sites will be taking advantage of the new broadband delivery capability that the two companies claim will result from the merger. Simply put: Time Warner is No. 2 in cable systems in the U.S. AOL is the nation's No. 1 Internet service provider. Today on AOL, you can see CBS News slide shows synchronized with sound in a 2-by-2-inch window on your PC. Tomorrow, you'll get full-screen CNN with interactive 3-D graphics and real-time video links.

MARK HALL is *Computerworld*'s West Coast bureau chief. You can contact him at **mark_hall@computerworld.com.**

AOL has been a strong voice for opening all cable systems to any and all Internet service providers, and it claims that the deal doesn't change a thing. If so, once AOL readies its site for Time Warner's cable network, it will permit other Internet service providers to hop on board. This situation will, I think, force AT&T, the No. 1 U.S. cable operator, to try and wiggle out of its exclusive contract with Excite@Home. Under this competitive pressure, a deal could be struck. AT&T could give AOL access to its cable systems in exchange for Time Warner letting it sell voice services over its cable operations.

No matter. The net result will be more work for you. You'll need to configure and manage servers that can deliver massive amounts of content much faster than they do today; install the biggest, quickest mass-storage systems available — and then install some more; and pull another T1 line or two to your site because you'll no longer be able to point the finger at an Internet service provider and complain about it as the bandwidth bottleneck. You'll be the bottleneck.

The myth of the Internet bandwidth bottleneck is about to evaporate. Next, we'll be hearing about boring e-commerce sites that are as slow as molasses. Just make sure they don't belong to you. ◗

MICHAEL USEEM

Leading out, up and fast in the '00 decade

LEADERS have followers. Leading is bringing those who work for you along with you. Or at least that's how we have traditionally conceived what leadership is all about.

But getting the job done now also means leading out and up — and doing everything with speed. This is especially the case for technology managers, where the fast alignment of people around and above them is essential for getting the job done before competitors do it first.

Leading out: As companies carry out more outsourcing and joint ventures in information services and other areas, they require new methods of execution. The skill of delegating work downward to subordinates is being supplemented by a talent for arranging work outward with partners. Lateral leadership — leveraging your partners' strengths instead of directing subordinates' actions — is required for achieving results when you have no authority to guarantee them.

MICHAEL USEEM is professor of management and director of the Center for Leadership and Change at The Wharton School at the University of Pennsylvania. He's also author of *The Leadership Moment: Nine True Stories of Triumph and Disaster and Their Lessons for Us All.* Contact him at **useem@wharton.upenn.edu.**

Consider a senior manager at a leading U.S. telecommunications company who was responsible for developing the firm's outsourcing agenda — a daunting assignment that involved more than $1 billion in hotly contested sourcing contracts for information services. Senior managers told him that cutting service costs and reducing management distraction were essential. With minimal guidance from above, he had to identify which services weren't core to the business and could thus be outsourced. Once he determined what should go, he then had to contract the right partners to provide the services less expensively and more consistently than his own staff would. And he had to convince the powerful managers of the firm's operating units — his internal customers — that the outsourcing deals would deliver just that.

Leading up: As companies have delegated responsibility downward, they've also been increasingly demanding that managers be able to lead their own bosses. If your boss lacks data, ensure he receives what's needed; if he's missing the boat, help him get aboard before it's too late.

Consider a senior manager at a retail stockbroker whose Internet strategy was virtually nonexistent. The obstacle was both his boss and the

board. Neither saw the Internet as a "killer" application if competitors applied it first, but he did. He labored to persuade his chief executive and directors that the future resided in online trading, even if it meant cannibalizing their existing franchise. Despite inside resistance and investor skepticism, he ultimately prevailed, and his company has become one of the industry's preeminent players.

Leading fast: As companies streamline processes and steamroll layers, they're moving at a breakneck rate never before conceived. They expect their managers to lead with speed in an era when new technologies enable it and first movers take competitive advantage of it.

Consider the telecommunications and brokerage managers I mentioned. If they hadn't led out and up immediately, managers at rival companies would have beaten them to it, leaving the managers' companies with less focus, higher costs and older technologies.

Leadership of information technology never demanded such diverse talents before. These capacities are becoming indispensable now. ◗

ALLAN E. ALTER

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COMPLEX vs. simple. Big vs. small. Centralized vs. distributed. Control vs. independence.

There's no doubt on which side corporate IT and its vendors belong. While paying lip service to simplicity, corporate IT keeps building huge, complex systems that require central administration and control.

Yet everyone knows that computing's epoch-making innovations — Macs and PCs, the Internet, the Palm — began as simple technologies that needed no central coordination. Chances are, that's how the next innovation in computing will emerge.

ALLAN E. ALTER is editor in chief of the *MIT Sloan Management Review* and a former *Computerworld* editor. Contact him at alter@mit.edu.

Which is why anyone interested in IT innovation should pay close attention to Patricia E. Moody, a manufacturing expert, and Richard E. Morley, a world-renowned entrepreneur and inventor whose work is on display at the Smithsonian Institution.

In the vision of computing's future laid out in their recent book, *The Technology Machine: How Manufacturing Will Work in the Year 2020* (The Free Press, 1999), today's big systems lose out to simpler, faster ones that won't need years of expensive implementation followed by intensive supervision.

As the authors see it, tomorrow's factories won't be run by big, complex, centrally run systems like ERP and MRP. Instead, factories will run themselves with little human supervision, using flocks of small, independent, intelligent systems.

Think of it. No human brain could create a system to accurately plan the individual transportation needs of hundreds of thousands of New Yorkers. Yet thousands of taxi drivers operate without central control by following a few simple rules: Stop when someone raises his arm, take him where he wants to go, collect payment and pick up your next job. Overall, that "system" works well.

Similarly, Moody and Morley envision that a host of independent devices embedded in factory equipment, programmed to follow a few rules and to make snap decisions, will run factories. This approach to manufacturing is already a fact of life in a few special plants, such as GM's Fort Wayne, Ind., paint shop. Running a paint shop is an unusually tough job; scheduling is complicated, and a jammed paint gun can throw off the best-laid plans. But the GM plant minimizes scheduling. Instead, a simple local software program, not a mainframe or human, allows the *paint booth* to select and sequence the work. As each truck comes down the line, the program tells the booths which color the truck should be. The booths, like rival contractors, then place "bids," based on whether they have the right color and amount of paint for the job. A booth loaded with the color the truck requires bids high, a booth low on paint bids lower, and one loaded with a different color bids lowest. The booth with the highest bid gets to paint the truck.

Moody and Morley say the same localized intelligence approach will someday create workflow systems, automate nonmanufacturing business processes and simulate and improve complex systems. Already, Japan's famous bullet trains use this approach to simulate its national railway system (in this program, the "trains" are software agents following a few rules) to improve train schedules and help decide where to build new lines. Moody and Morley write that simpler, smaller systems will enable localized manufacturing: The television sets or PCs you buy at Wal-Mart will be custom-built there by small, portable factories parked behind the shipping dock, staffed by a handful of workers.

Give individual machines just enough intelligence to follow a few rules, then let them do their thing: What a different direction from today's bloated, burdensome brand of computing! Think about it. ◗

READERS' LETTERS

Y2K coverage review

I AGREE with the implication of Maryfran Johnson's editorial ["End of (Y2K) Days," News Opinion, Dec. 20] that *Computerworld* has, in comparison with the rest of the computer press, done a standout job in covering Y2K. Indeed, there were three items she failed to claim credit for: First, Richard L. Conners' long letter, "Advantages of Julian Dates [Sept. 27, 1982]. (By "Julian," he meant a day-count format, not a YRDAY format.)

One advantage he mentioned was the avoidance of a rollover problem when the 21st century arrived. This letter helped motivate me to write a proposal that led to the inclusion of a day-count format (and four conversion functions) in Cobol. (Day 1 is Jan. 1, 1601, borrowed from Jerome T. and Marilyn J. Murray's *Computers in Crisis* book, reviewed in *Computerworld* May 14, 1984.)

Second, Richard D. Langston's letter, "Time . . ." [Feb. 25, 1991], describing the windowing-plus-date-expansion (to eight digits) technique he designed to handle user-input dates for the SAS Institute's decision-support software. It's a pity this didn't start a bandwagon rolling then.

The third was Randall Hitchens' article "Dating Problems Now? Wait 'til the Year 2000" [Jan. 28, 1991]. This predated Peter de Jager's "call to arms" by two and a half years, even though it was less urgently phrased than subsequent wake-up calls.

However, despite this relatively good record in sounding the alarm, I can't help regretting what might have been. There were nearly seven lean years, from early '84 through early '91, during which nothing on Y2K appeared in *Computerworld*. After your articles on Mr. Schoen in 1984, I'd hoped there would be one or two Y2K follow-on articles, editorials and letters per year. It was apparent from the start that computerdom needed substantial nudging before it would budge on this matter and that Y2K crusaders needed the ammo that press coverage would have provided. If *Computerworld* had taken on that gadfly role, it would now merit not only a pat on the back, but also every journalism award under the sun. Too bad.

Roger Knights
Seattle

Bright future in IT

IN RESPONSE to James Bell's letter in the Dec. 13 issue, "Wanted: IT Incentives," I am a senior majoring in MIS with a minor in management. I am to graduate in May and have already secured a job with a major oil company in Houston. This position will allow me a limitless opportunity to grow and develop my skills. As a result, I hardly feel they will be obsolete in three to five years. Furthermore, I do not feel that an entry-level position with a salary in excess of $45,000 would be considered low-paying. Several of my peers have had similar offers.

I have experience as a computer tech and an IS intern, but I don't feel that it is anything extraordinary. Maybe I am just lucky to attend a university that actively helps seniors seek out potential employers for placement after graduation. Maybe I am just lucky to be recruited by a great company that values their IT staff. Or maybe I am just lucky.

Andrew Dyer
Oklahoma City
adyer@flash.net

COMPUTERWORLD welcomes comments from its readers. Letters shouldn't exceed 200 words and should be addressed to Jamie Eckle, letters editor, Computerworld, PO Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701. Fax: (508) 879-4843. Include an address and phone number for immediate verification. Internet: letters@computerworld.com.

Windows 2000

What is Windows 2000 Advantage?

Windows 2000 Advantage is the partnership among Microsoft, Compaq and Computerworld Enterprise Business Solutions to inform IT leaders about Windows NT and Windows 2000 technology by providing timely, useful information — in print and online — for planning and deploying Windows NT and Windows 2000 with Compaq services and solutions.

Online This Week

Portable users take a big step forward with Windows 2000

More than any previous Microsoft operating system, Windows 2000 is oriented toward mobile users. Enhancements range from increased battery life to encryption. Portable PC users who travel, go to meetings or swap accessories will find much to like in Windows 2000, which bends the old rules of mobile computing to make portability easier.

DNS simplifies management, reduces administration

The Windows 2000 implementation of the Domain Name System (DNS) Internet interoperability standard makes it easier for users to communicate and holds down the costs of network management and administration.

Compaq offers migration help

Well aware of the challenges facing its customers as they convert to Windows 2000, Compaq is offering an array of options through its Professional Services group designed to enhance the migration experience.

Quickpoll **How important is it for you to be able to use a computer when you're out of the office?**

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www.Windows2000Advantage.com.

And check out last month's results: ▶
As a current user of Windows NT, how well do you understand the Active Directory in Windows 2000?
Sample size: 417

Microsoft

Exchange 2000 promises enhanced messaging

Server will share same Active Directory as Windows 2000

By Jacqueline Emigh

Microsoft's Exchange 2000 promises to revolutionize messaging in the new millennium. When the messaging server ships toward midyear, end users will be able to enjoy an array of new features that include integrated videoconferencing, wireless smart phone connectivity and information access from virtually anywhere in the Windows or Internet environment. Underlying these innovative bells and whistles is a robust new architecture that offers greater scalability, easier management and faster database backup for administrators.

"Microsoft is building Exchange 2000 brand-new, from the ground up," declares Dave Sapery, senior systems architect at Corporate Software and Training, a Microsoft solutions provider in Waltham, Mass. Microsoft hasn't yet set a release date for the new messaging server, which is now in its third beta, but observers expect it will ship several months after the February release of Windows 2000. Many are predicting May or June as the likely time frame.

Exchange 2000 will share the same Active Directory as Windows 2000, but the new messaging server will retain a separate database. Renamed "Web Store" for the Exchange 2000 release, the Exchange database adds support for a new protocol called Multimedia Messaging Format, aimed at allowing native storage in many different file formats.

As a result, users will be able to access e-mail messages, Web pages, applications and even streaming video and audio content not just from Microsoft Outlook, but also from a wide range of other client software, said Greg Baribault, Microsoft's program manager for Exchange Server, speaking at the recent Microsoft Exchange Conference in Atlanta.

Alternative access methods will include Web browsers, the DOS prompt, Microsoft 32-bit applications and any e-mail client that supports conventionally accepted Internet messaging standards. Also, for storage of streaming media, Microsoft has now adopted support for the SLV (super long value) database format.

Also new in Exchange 2000 are database partitioning and clustering. Though these features are targeted mainly at Exchange administrators, end users stand to benefit from them due to the reduced downtime they will engender. If, for example, users need to e-mail an important document first thing in the morning, they will be much less likely to find that the Exchange server is still down for backup.

"System backup and restore should now be a lot easier," affirms Martin Lachance, principal engineer at Toast Technologies Inc., an Exchange 2000 beta tester in Malden, Mass. ◗

To read the full text of this story, visit **www.Windows2000Advantage.com**.

ADVANTAGE

The Web Magazine for IT Leaders Implementing Windows NT and Windows 2000 with Compaq Services and Solutions

DATELINE: WINDOWS 2000

By Laura DiDio

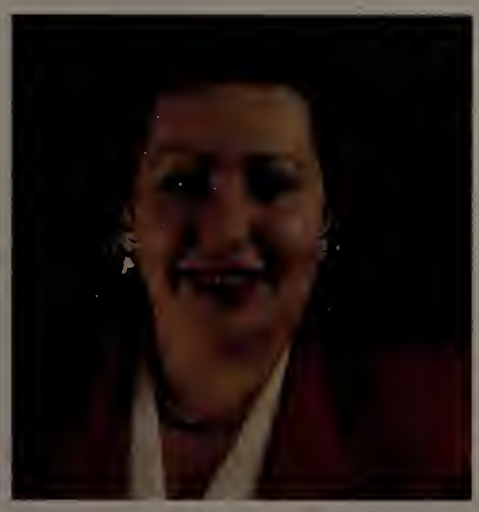
Users cautiously optimistic about Windows 2000

All talk of Windows 2000 migration boils down to a single question: "When?"

That the question is "when" and not "if" is a testament to Microsoft's continuing clout, marketing muscle and its determination to forge ahead despite the ever-present threat of potentially damaging actions by Judge Thomas Penfield Jackson and the U.S. Department of Justice.

Early indications are that the majority of mainstream Windows 2000 Server deployments — 55% — will take place six to 18 months after Microsoft ships the product in February. That's according to two recent, independent surveys of 1,100 and 600 businesses, respectively, by Giga Information Group Inc. and Sunbelt Software Inc. The first survey polled IT managers on a variety of issues ranging from their timetable for deployment, most compelling reasons for deployment or delayed deployment to confidence levels on the quality, reliability and stability of Windows 2000 Professional and Server. The second survey dealt exclusively with user response and reaction to the Windows 2000 Professional beta.

The news was particularly good with respect to Windows 2000 Professional. Ninety percent of the 600 beta testers, some of whom are already deploying the product in production networks, said they were more satisfied with the increased feature set and functionality of Windows 2000 Professional compared with Windows 9x or Windows NT Workstation.



"Early indications are that the majority of mainstream Windows 2000 Server deployments will take place six to 18 months after it ships."

— Laura DiDio, Giga Information Group

Overall, the feedback from both surveys shows that businesses are cautiously optimistic that Microsoft will deliver a more stable 1.0 release than prior versions. At the same time, companies are approaching Windows 2000 Professional and Server with a high degree of pragmatism. The responses suggest that most shops will take a controlled, phased approach to migration predicated on a compelling business need.

That is extremely wise because the "when" of a Windows 2000 migration can be a blessing or a curse depending on how your individual business chooses to proceed. Many a CIO and IT manager find themselves cast as modern-day, high-tech Hamlets, wringing their hands over when to migrate, which server version of Windows 2000 to adopt and how to migrate — all at once or a phased migration. ◗

To read the full text of this column, visit **www.Windows2000Advantage.com**.

Point of View

iPAQ running Windows 2000 earns praise from analysts

By Bruce Hoard

The marriage of Compaq's new legacy-free iPAQ Internet device with Windows 2000 is a critical success. The value of providing such a platform with Windows 2000 has generated a great deal of enthusiasm and interest among industry analysts and customers alike beyond anyone's expectations.

Giga Information Group Vice President Rob Enderle was among the first to weigh in on iPAQ/Windows 2000, saying, "Coupled with Windows 2000, this class of machine should set uptime records as well as provide an optimized Total Economic Impact. It represents the best value in the market until the next step in this evolution occurs in 12 to 24 months. Compaq is running three to six months ahead of the market with iPAQ, and some vendors will lag with this technology."

iPAQ basics

Compaq has positioned iPAQ as a legacy-free Internet device that will provide users with a dedicated Internet companion that is uniquely designed to take full advantage of the reliability, manageability and ease of Internet access features found in Windows 2000 Professional.

The network-ready iPAQ has Universal Serial Bus ports in place of ISA/PCI expansion slots and legacy ports. By eliminating legacy technology, iPAQ reduces the potential for hardware and software conflicts while significantly lowering support costs. In addition, its design allows access to memory and hard drives through a removable side panel, keeping deployment, maintenance and operating costs low. A version with legacy ports, such as serial, parallel and PS/2, is also available.

Although iPAQ and Windows 2000 seem to be an ideal match, iPAQ wasn't originally created with only Windows 2000 in mind, according to John Mason, Compaq's director, iComputing, Internet products and services division. Mason goes on to say that both Microsoft and Intel became involved with iPAQ early in the development stage.

"iPAQ's timing coincided very nicely with the development of Windows 2000," Mason notes. ◗

To read the full text, visit www.Windows2000-Advantage.com.

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JOHN GANTZ

Worst is over, so take advantage of the Y2K windfall

"EVERY KIND OF nut, charlatan and headline-seeker will be making pronouncements about Y2K and our previously obscure profession."

Say, who said that? Oh, now I remember — I did! More than a year ago, in fact, in my last column of 1998. I was talking about the downside of all the light that would be shining on the information technology profession during 1999. Did we want all that scrutiny? Did we want to be in the position of being either the creators of the bug that ended civilization as we know it or alarmists like Chicken Little?

JOHN GANTZ is a senior vice president at International Data Corp. in Framingham, Mass. Contact him at jgantz@idcresearch.com.

Well, the headline-seeking came to pass, and Y2K was hyped beyond belief — despite, I might add, my repeated assurances in this column that it would have minimal impact on the economy. My company has even gone on record with an estimate of how much the world overprepared for the millennium change ($65 billion to $75 billion).

Nevertheless, there seems to be little fallout from the overhyping of Y2K. Those nuts, charlatans and headline-seekers have all pretty much declared victory over the Y2K plague and gone on to other business. They're crediting themselves for raising the alarm and the IT profession for eradicating the bug. I only know of one foreign minister who had to resign for whipping his population into a froth over Y2K.

Your mission, should you decide to accept it, is to take advantage of this post-Y2K euphoria. Here are some tips:

- At every chance, lament how much the politicians, tort lawyers and media hyped Y2K. You knew all along that your company was well protected (proving your loyalty and sagacity).
- Point out that there are still plenty of Y2K issues to face — such as fixing all those date-related database entries in your customer records (reinforcing that there was a problem in the first place).
- Talk about how Y2K gave the country a much-improved computer base, which will make us more competitive with our trading partners (deflecting criticism that you overprepared; the Y2K spin doctors have already widely publicized this argument).
- Launch immediate plans to turn your company into an e-business (preserving IT department momentum).

According to International Data Corp.'s (IDC) Project Magellan Y2K research (*www.idc.com*), government agencies and U.S. corporations spent $42 billion last year working on Y2K. This year, they'll need to spend less than $12 billion. Yet, from all indications, IT budgets across the country will rise an aggregate 5% to 10% this year. That means there will be about $50 billion in new IT spending, plus the $30 billion Y2K windfall. So, while the economy is good, let's make sure we keep that money.

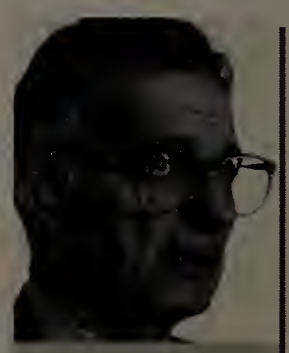
In a survey of more than 1,000 North American companies last year, IDC asked what the key post-Y2K priorities would be. No. 1 was implementing enterprisewide applications. No. 2: expanding and improving Web sites. A good e-commerce effort will do both.

Obviously, business managers aren't going to spend willy-nilly on IT. But the IT profession is getting pretty good press right now, and its credibility has never been higher. What better time to make a bid to be entrusted with more responsibility for your company's future? Go for it. ◗

RALPH NADER

Digital signature legislation must protect consumers

A WINDOW SALESMAN talks an elderly woman into buying 10 windows for $10,000. She signs several papers, including one whereby she consents to receive the contract and all notices relating to the sale over the Internet at an e-mail address established for her by the salesman. She doesn't own or know how to use a computer. The window salesman doesn't provide any paper copies of the documents.



RALPH NADER is a consumer advocate based in Washington. Contact him at ralph@essential.org.

A savvy young man decides to buy a car but finds he must first sign a consent form similar to the one presented to the elderly woman. He objects, but the salesman says if the young man doesn't agree to receive everything electronically, the car's price will rise by $1,000.

A professor shops the Web for a PC and enters into a contract to buy one. He agrees to receive the contract and other legal documents electronically. His copy of the contract is sent in WordPerfect 6.0 format; to open and print it, he must save it as a Microsoft Word file. The computer arrives but isn't the one he ordered or the one referred to in his contract. He contacts the computer dealer and is told that he received what the dealer's version of the contract indicates. The professor's attorney tells him he is stuck: He doesn't have a copy of the contract that he can use in court, and terms in the contract that he was sent don't match the terms on the Web page.

All of the situations depicted in these scenarios are currently illegal but would be made legal under HR 1714 — the Third Millennium Digital Commerce Act — which overwhelmingly passed the House of Representatives in November, despite the threat of a presidential veto. The bill, under the guise of facilitating e-commerce, would eviscerate numerous state and federal consumer protection laws. If the act is made law, states would be prohibited from passing e-commerce laws to protect their own citizens.

A much more judicious bill on the same subject passed the Senate soon after. However, the Senate version — S 761 — allows consenting parties to enter into contracts using electronic records and electronic signatures. States are permitted to protect their consumers as they deem fit.

The Federal Trade Commission and consumer groups have objected to the overreaching provisions of the House bill. The consumer groups have proposed the following basic standards for a federal law that governs e-commerce:

1. Electronic disclosures should be permitted only when the transaction is initiated and consummated electronically.

2. When electronic signatures are required, the technologies used must be reasonable, reflect an actual intent to sign a document (not merely opening a package of shrink-wrapped software) and be attached only to documents that are unalterable after the signature is attached.

3. The consumer should be given the opportunity to accept or refuse disclosures electronically without surcharges.

4. The consumer must be able to obtain paper copies at a reasonable cost and in a timely manner.

5. The disclosures must actually be delivered to the consumer's e-mail address with a reply requested or must be retained on the seller's Web site for the duration of the contract.

6. When disclosures are provided to consumers through a seller's or creditor's Web site, they must be retained for the duration of the contract.

7. The electronic record must be accessible and retainable by the consumer. It must also be provided in a format that prevents alteration after it's sent, so it can be used to prove the terms of the record in a court of law.

8. The consumer's failure to respond to the consent request should trigger paper disclosures, before the failure to respond triggers default.

Let Congress know that digital signature legislation must take into account the practical issues that are important for consumer protection. ◗

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BUSINESS

CONDEMNED.ORG

Law enforcement agencies often have no legal recourse to shut down child pornography on the Net, but Condemned.org, a new group of online vigilantes, is taking action. Within 10 days of forming, Condemned.org eradicated more than 20 child pornography servers. ▸ 40

DUPLICATION

With offices in more than 190 countries, Siemens AG has a lot of duplicate accounting activities. In an effort to cut accounting costs by 30%, the German electronics giant is in the early stages of creating a shared accounting services model that will rely heavily on standardized software. ▸ 42

NEW IT WORLD

IT professionals need to get with the program if they want to survive, warns Peter G. W. Keen, who is pessimistic about whether IT will recognize what e-commerce demands in the way of business skills. If techies want to make it in the new economy, they need to get off the sidelines and start playing the game, he warns. ▸ 46

IT IN 2010

What will corporate IT look like in 10 years? Will it be dead, as some predict? Most likely not. But many analysts agree that because of fast-changing technologies, the world of IT will be smaller and look very different from the department you may be working in today. ▸ 50

UGLY TERMS

Stop with Y2K, begs the Jargon Judge, who says it's ugly and doesn't follow the rules of acronyms, initials or abbreviations. If we don't stop here, she warns, our language will become a mix of characters and letters that most people don't recognize. ▸ 54

PROTECT IDEAS

Got a hot idea for an IT product? If so, you'd better make sure your company doesn't steal it from you. To protect your invention, you need to get legal advice every step of the way because your employer has a claim of ownership if you have used company resources to develop or market the product. ▸ 56

MANAGE RISK

Risk management, long a tool for financial managers, is rapidly becoming a strategic process in the data center. As more data moves online, risk management in data security is becoming increasingly important. See QuickStudy. ▸ 58

BUY VS. BUILD

There is no time to waste in today's fast-paced Internet economy. To keep up with the competition, the best solution may be a dot-com that has the right technology, advises Kevin Fogarty. ▸ 42

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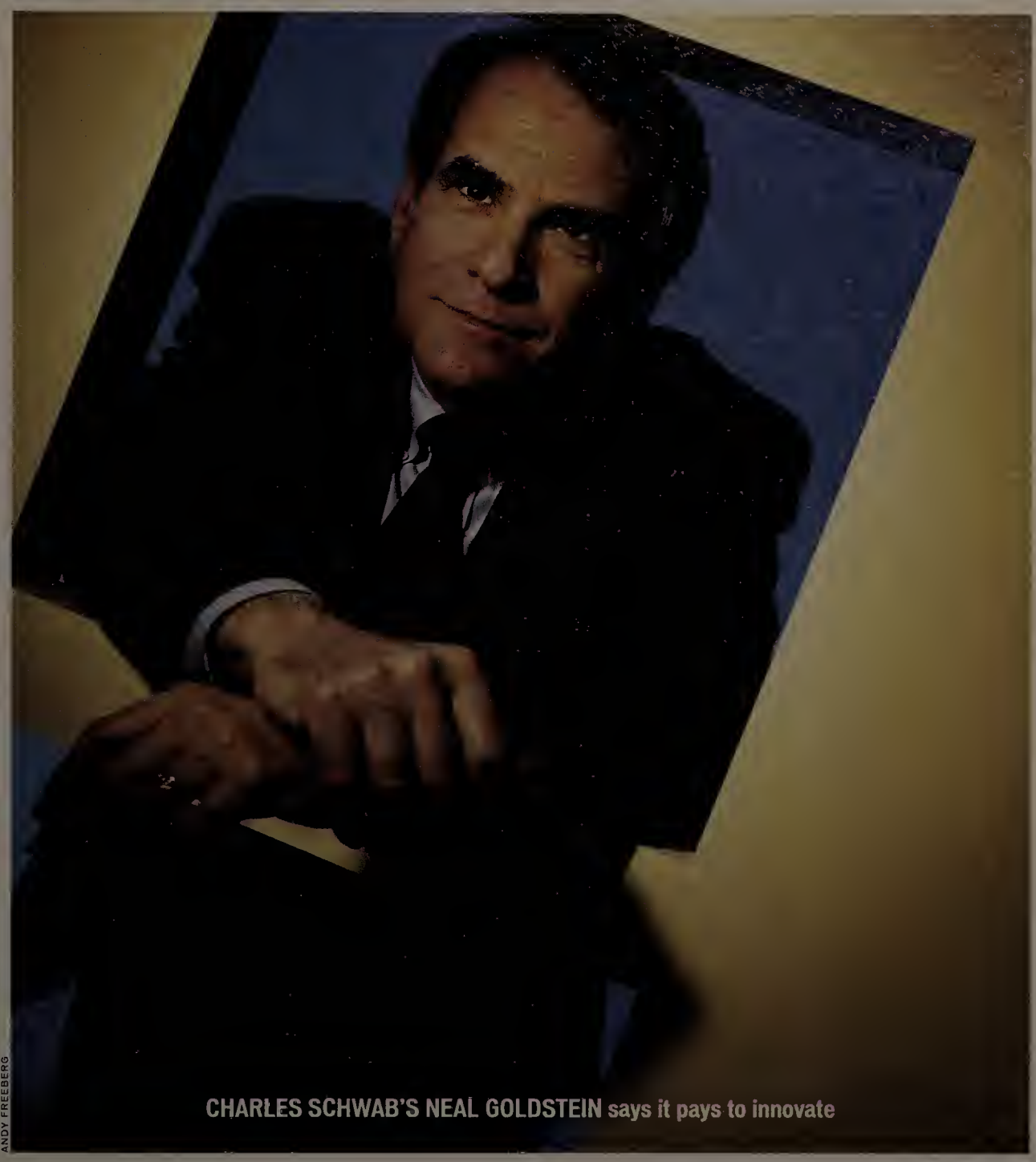

ANDY FREEBERG

CHARLES SCHWAB'S NEAL GOLDSTEIN says it pays to innovate

LEADING-EDGE RISKS IN IT

ROLLING OUT a new technology before the competition does can result in a big win. But there's a flip side: risk. What happens if the technology flops? Charles Schwab's Neal Goldstein says the cost of not being an innovator is greater than taking a gamble with a technology that doesn't pan out. And you can minimize the risk by making informed choices.

52

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Vigilante Group Targets Child Pornography Sites

Hacking raises questions about IT's role, legal limitations

BY DEBORAH RADCLIFF

A NEW GROUP of online activists is raising questions about just how far information technology people should go to stop illegal activity online.

In mid-December, some 30 seasoned information security professionals, "white hat" hackers and technologists formed Condemned.org, an activist group dedicated to "eradicat[ing] the existence of child pornography, pedophilia and exploitation on the Internet."

As of its 10th day of operation, Dec. 21, Condemned.org claimed to have "eradicated" more than 20 child pornography servers through proper legal channels, according to Kent Browne, a 40-year-old systems architect for an East Coast consulting firm and a spokesman for Condemned.org.

Browne also claimed that members have hacked into more than 13 servers overseas and erased their hard drives.

Even as some legal experts condemn the attacks, Browne claimed that technologists are lining up to join the fight.

"Everyone that I have spoken to is so anti-child-pornography that they literally beg me to find something for them to do to help," said Ben Bidner, a security administrator for a Web server group in Australia who founded and runs the Condemned.org server.

Condemned also got support from a half-dozen Internet service providers, as well as Web development and security companies in Australia and the U.S., such as Geoday Pty., DuFunk and Ionl2 Web Development.

"Condemned.org is striving not only to rid these servers from the Internet, but to make the public aware that we are here actively opposing child pornography," Bidner said.

Comstar.net, a corporate Internet service provider in Atlanta, has joined the cause, offering the group a free mirror site and connectivity. "It's the best cause I've ever come across on the Internet," said Jerry Zepp, Comstar's chief security officer.

GIORGIO PALMISANO

CHILD PORNOGRAPHY is "horrid, horrid," says Kent Browne, a spokesman for vigilante group Condemned.org and a systems architect

Condemned.org aims to make it simple for "normal Internet users" to report offending Web addresses by filling out a simple template located at *www.condemned.org*.

Condemned.org pushes the information forward to law enforcement agencies — local field offices of the FBI when servers are discovered in the U.S., and the Western Australian Police Web server.

But Condemned also takes action of its own, Zepp said.

First, Condemned.org volunteers notify server administrators of the illegal material stored on their machines' hard drives. Most are responsive, especially administrators at free e-mail services and Internet service providers who are unaware of the material at first, Browne said.

America Online Inc., for example, said it has a general policy of terminating an account, then notifying law enforcement if it's made aware of illegal images or child-porn-related screen names.

But when neither administrators nor law enforcement officials respond, Condemned.org resorts to hacking. Although no one at the organization would admit to hacking servers in the U.S., Browne acknowledged that a few Condemned.org volunteers have taken out 13 overseas sites this way.

To Report

www.condemned.org
www.cyberangels.org
www.unesco.org — to report non-U.S. servers

"We have hacked some of these sites in areas of the world where there are no laws," he said. "In those countries, we've taken servers completely offline with buffer overflows or straight exploits written by a couple of guys on our staff. Once we get in, we erase their file directories and everything on their hard drives."

But according to some experts, such attacks, in addition to being illegal, may be counterproductive.

"Groups that are hacking these sites are making it hard for us to convict the pedophiles behind those sites," said Parry Aftab, an attorney and president of CyberAngels.org, a 6-year-old anti-pedophile group with 1,400 volunteer members. "If you take down a server, you take away my evidence," he said.

"If someone's using an Internet connection from the U.S. to hack other servers, it's a violation of cyberterrorism laws," said Aftab, who has written two books on children's online safety. "Heck, I'd love to string up every pedophile on the earth, but we can't do that. We don't live in a lawless society."

Official Reticence

Pete Gulotta, special agent for the Baltimore office of the FBI's Innocent Images child pornography detail, agrees that taking down overseas sites may impede prosecutions, but he wouldn't offer an opinion on the legality of the attacks.

The FBI and U.S. Customs Service officials work with foreign governments on international investigations, often undercover. "The problem lies with countries that don't have treaties with the U.S., some of which are in the Pacific Rim," Gulotta explained. "If you have servers in places like that, you're not going to get satisfaction with any law enforcement effort."

Other security experts are more vehement. "Certain things in our society are blatantly offensive. And one of those things is kiddie porn," said Winn Schwartau, founder of security consultancy Interpac Inc. in Seminole, Fla. "The amount of damage caused by leaving these servers up is far greater than the damage caused by a few hackers."

Jeffrey Hormann, commander of the U.S. Army's Computer Crime Investigative Unit, said the attacks threaten more than just pornographers.

"One of the greatest problems law enforcement has in policing cyberspace is the view that cyberspace is so vastly different than the physical world. So we allow the technical community to take it upon itself to stop groups allegedly involved in child pornography," Hormann said. "But what about online gambling or groups professing hate crimes. Do we allow attacks on their servers, too? In the physical world, we don't allow the businessman whose store has been broken into to hunt down and retaliate against the perpetrator."

While federal agents don't publicly condone online server assaults, most law enforcement officials turn a blind eye, according to Browne and Schwartau, both of whom have had extensive off-the-record debates with law enforcement associates.

"[Authorities] said to me, 'If you get up before any judge in the world, chances are he has kids and he's not going to convict you,' " Browne said. "Who would? This is horrid, horrid."

Radcliff is a Computerworld *contributing writer in Northern California. Contact her at drad@aol.com.*

Wanted: A Few Good Cybercops

When it comes to fighting online child pornography, it seems law enforcement could use a little help from techie friends.

"We can't keep up," says Don Huycke, a senior special agent at the Customs Service. Huycke works child pornography cases out of the Cyber Smuggling Unit in Washington.

But things are changing. The FBI's Innocent Images opened four new offices last year and has doubled its caseload from 702 cases in fiscal year 1998 to 1,500 in fiscal 1999.

"We're running an excellent conviction rate of 95%," says Pete Gulotta, a special agent at the Baltimore office of the FBI's Innocent Images child pornography detail. "Of the 468 arrests we've made since 1995, 384 led to conviction. The majority of the rest are pending."

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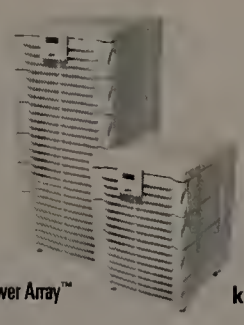

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Siemens Slashing Accounting Costs

Amid flat growth, electronics giant aims to consolidate operations, cut costs by 30%

BY THOMAS HOFFMAN

With offices in more than 190 nations, Siemens AG runs a lot of redundant back-office activities, with accounting near the top of the heap.

And with financial analysts saying its order and sales growth will be flat for the foreseeable future, the company has no choice but to cut costs. The German electronics giant is in the early stages of creating a shared accounting services model, designed to cut accounting costs 30% by relying on standardized software and common business processes.

The project makes a lot of sense for Siemens, financial analysts said. Should Siemens hit its cost-savings goals, it will be able to wipe out at least $15 million in annual overhead.

Last year, the company reported $1.98 billion in net income on $73.05 billion in sales.

"We have a large number of accounting departments around the world, and many are [small offices]," each of which had been running independently, said Guenther Gruber, head of shared accounting services for Siemens in Munich, Germany. In Europe alone, Siemens has more than 70 accounting departments outside Germany, Gruber said.

He placed Siemens' global accounting costs in the "three-digit million" deutschemark range. So, if it costs Siemens 100 million deutschemarks to run its global accounting operations, that would translate to $52.43 million.

Given its geographic expanse, Siemens has decided to create national accounting service centers in countries where it has a significant presence. It will also create cross-border accounting centers to support its smaller offices.

Siemens' effort reflects a growing trend among big multinational companies to "try to take advantage of economies of scale and consolidate a lot of these services so they're not paying so much for duplicate operations," said Alan D. Kahn, president of The AJK Financial Group, a Syosset, N.Y., financial planning consultancy.

One of the keys to Siemens' shared accounting services effort is its plan to standardize on SAP AG's accounting software. However, where it makes sense to do so, some Siemens shared accounting centers will remain on legacy or other non-SAP logistics systems to connect to the SAP accounting systems.

To do that, Gruber said it has invested "a couple of hundred thousand deutschemarks," or roughly $100,000, to purchase enterprise application integration software from CrossWorlds Software Inc. in Burlingame, Calif. Gruber said Siemens evaluated several vendors but selected CrossWorlds because it offered the best combination of functionality and application programming interfaces to the SAP environment.

> [We want a model where] accounting people are no longer overhead producers, but quality producers.
>
> GUENTHER GRUBER, HEAD OF SHARED ACCOUNTING SERVICES, SIEMENS AG

Siemens launched a shared accounting services pilot program last spring with three of its business units in Singapore, Malaysia and the U.K. The units went live with those services Oct. 1, the start of Siemens' fiscal year. So far, the effort has gone smoothly, Gruber said.

Once the firm closes out its first fiscal quarter this month, it plans to begin extending the shared accounting services to other Siemens companies in Asia, Europe, North America and Australia on a "step-by-step" basis, said Gruber.

He added that Siemens faces a couple of significant challenges to make the project successful, including personnel issues. That involves training, motivating and transitioning accountants from a headquarters-style accounting approach to a services model where "accounting people are no longer overhead producers, but quality producers" at a measurable price, Gruber said.

KEVIN FOGARTY/BRICKS AND CLICKS

Can't beat 'em? Buy 'em

LAST WEEK, an Internet company that started life as little more than a bulletin board for gamers announced a deal to take control of the most powerful brick-and-mortar media company on Earth. Neat trick, eh?

The biggest winner in this deal may not be AOL, but Time Warner, which has exquisite brands and products but has been unable to build a credible Internet presence.

It has that now, in spades. But wouldn't it have been better — and cheaper — if Time Warner bought AOL outright two years ago, when AOL's stock hovered around $15 per share, rather than the $60 to $80 range it's been in for most of the past 12 months?

Hindsight. Sure.

A clear vision of the past can help show the future as well. Most dot-coms aren't in nearly as strong a position as AOL was in the Time Warner deal. Not only does AOL have a higher market capitalization, it also has profits that are four and a half times those of Time Warner's, even with one-fifth the revenue.

But by all accounts, Steve Case, AOL's boss, knew where he wanted to go. And when the time was right, he acted. The time may be right for you to move, too, before your future becomes part of your competitor's past. Rather than building an e-business, should you just buy one?

The leaders in your particular market might be too covered in the gobs of money Wall Street has been throwing at them to be touchable. But the more minor players might be amenable. Not being the leader doesn't mean they don't have the technology or talent to make the grade, with help.

Look at CVS.com, which started life as Soma.com, one of two or three drugstore start-ups scrapping for share online. CVS bought Soma.com and helped turn it into one of the more successful drugstore sites. CVS used its stores and marketing know-how to extend the business, including a partnership last week with popular medical information site Healtheon/WebMD.

KEVIN FOGARTY is *Computerworld*'s business editor. Contact him at kevin_fogarty@computerworld.com.

In the hot toy market, the parent company of KB Toys avoided the embarrassment Toys R Us has suffered by teaming up with Brainplay.com, an online kid products retailer, to build the most successful clicks-and-mortar toy operation of the season.

It only makes sense that if an online competitor is ready to eat your lunch, you join him for the meal.

If you can't buy a competitor outright, invest in one, then offer services you've built that it has to pay others for, like logistics, product development or technical support. Let the competitor make a sale online and fulfill it from your own inventory, taking a cut for the service and hopefully another one from the profits you've helped your partner make. If your partner succeeds, you may make more from the investment than from the sales.

But money isn't the only thing to be made. With an e-commerce partner you can grow your own Web talent as well. Seed your partner's staff with some of your people, whose mission is to learn how to build an online business, then bring them home to plant that knowledge throughout the rest of the company. That kind of joint development can turn independent companies working in two different worlds into a hybrid organization that can operate effectively wherever there's money to be made.

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WORKSTYLES

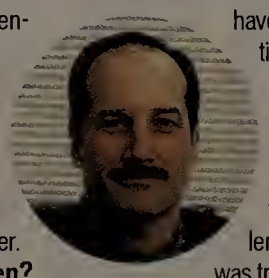
FleetBoston Financial During the Year 2000 Rollover

An information systems vice president at FleetBoston Financial shares what the Y2K rollover was like inside one of the company's main information technology command centers and the company's plans for the future.

Interviewee: Paul Archambault, vice president, information systems

Company: FleetBoston Financial Corp., Boston

Tenure: 16 years



Y2K location: The Y2K Communications Center for Technology (a.k.a. C3) in an Albany, N.Y., data center. Three conference rooms were commandeered for the center.

When did C3 open? "Thursday the 30th, around the clock. The corporate center in Boston [C4] opened Monday the 27th and started operating 24 hours on Thursday."

Was a security badge/card needed to get into the building? "Yes. This is ordinarily a secure building, but we had three security guards at the door [during Y2K preparations]."

Number of IT employees on duty at midnight: 25 to 30 in Albany.

Number of employees on duty at midnight: 4,000 stationed in other command centers or on call worldwide.

How did that shift compare with other experiences in your IT career? "It was our largest effort ever, and to come through as clean as we did, without a hitch, it was great. The excitement building up to the ball dropping in Times Square was something I haven't experienced before. I was confident, but the waiting to see it hit and see that it would work – the anticipation was incredible."

What was the worst scenario you had imagined? "Things like power and phone outages – what that would do to our overall ability to communicate with the organization, although we had backups in place."

What happened at the stroke of midnight? "A lot of high-fiving and a number of hugs. The ball dropped, and the consoles were still running, and it was business as usual. Getting through the first couple of seconds was exciting."

When did you breathe your first sigh of relief? "I first started to feel that we were in the kind of shape I had expected about 30 minutes after midnight. But the first time I felt totally comfortable that we were out of the woods was after the first night's processing [Jan. 3]."

What did you learn about your staff that night? "If I look at the entire project, I'd say we have done large initiatives before, but to watch people from all the lines of business come together the way we did for this, and the length of time we did, was truly outstanding."

Will the staff get any perks for the project? "We'll have a celebratory dinner at a hotel for our key Y2K staff members after we get through the leap [day], and we have a Y2K employee availability policy that will allow additional vacation days to the folks who worked through the rollover."

What have you learned as a manager from all this? "Leadership was definitely a key, and some great people gave extremely strong leadership to this project."

What will all of you do now? "Feb. 29, leap [day], is certainly the next watch point. The next big focus toward the end of the first quarter will be on the integration and conversion work of the merger [between Fleet Financial Group Inc. and BankBoston]. Also, e-commerce – expanding our online cash management capabilities for corporate customers and enhancing online products for consumers." People who were involved with Y2K were doing Y2K work in addition to their everyday duties. They will shift their focus back on those other projects.

Quote: "It was really something I know I haven't felt before, going through that whole process and watching it come to fruition. As I talked to people throughout the organization, I hear the same response, 'I've never been so excited to be bored for a New Year's celebration.' That sums it up." – *Leslie Goff*

PETER G. W. KEEN

Ready for IT-plus?

TWO DAYS BEFORE CHRISTMAS, *USA Today* ran a story on the front of its Money section detailing the problems behind returning gifts bought over the Web. Pay attention, IT — please. The e-commerce story and its prominence are noteworthy. It's yet another reminder that technology is now at the very center of business, not at its periphery. We've never seen as much coverage of IT as in the past few months — Y2K, of course, as well as e-commerce, technology stocks and IPOs.

What's noteworthy is that the *USA Today* article wasn't about Web site technology but business processes. The recent Y2K discussion was increasingly not about programming but organizational processes. The technology stock and IPO fever isn't just about technology innovations but far more about business models.

Is IT ready to play a value-adding role in this new game of "technology-plus" and become "IT-plus" (IT + business, IT + process, IT + business model)? Probably not, sadly.

For the first time in my 35 years in the IT field, I'm pessimistic about the readiness of many IT professionals to recognize that e-commerce, as the mainstream way of doing business, demands that they not sit on the sidelines and assume that their current skills, interests, career paths and knowledge guarantee them the same relevance to this new IT-plus world as they had in the world of just plain-old IT.

My pessimism has increased over the past six months. When I'm with any business group, there's never a half-hour in which the Internet and e-commerce don't come up in conversation. When I'm talking with business school academics, there isn't even a two-minute gap between discussions about distance learning, their new e-commerce MBA programs or their new e-commerce research institutes.

But if I want to get away from the e-commerce hubbub, all I need to do is seek out an IT group. On the whole, IT isn't that interested in it.

If I want to get away from the e-commerce hubbub, all I need to do is seek out an IT group.

This was brought home to me by a Concours Group survey of more than 100 IT professionals. The IT professionals said their top five career interests are the traditional IT career paths, none of which include e-commerce. In a self-rating of current skills from a list of 22, they said their seven weakest include e-commerce, international business, mobile communications, Internet design and Web design. These are the *business* growth areas for the next decade, but these IT professionals don't see them as their — and IT's — growth areas. Asked to rank which skills are most important for tomorrow, e-commerce placed eighth. So, basically, these people like building systems, enjoy their jobs and aren't interested in all the stuff the *USA Today* story saw as important.

The past two years have been tough for IT, with such issues as Y2K, enterprise resource planning, legacy systems and the complexity of supporting more desktops with more middleware. IT has moved away from the business dialogue and back into its traditional and relatively isolated space of straight technology with occasional forays into the business.

I'm sure most IT professionals will agree that e-commerce is the future -– at least I hope so. But it looks to me like they're discounting what that means for themselves and IT. They're mainly going to watch from the sidelines.

The business game *USA Today* reports on needs the very best IT-plus professionals — ones who know technology and process, technology and business, and technology and organization, and love dealing with the challenges that IT-plus provides.

The "IT as-is" professionals are saying that they like their own business-as-usual. But e-commerce is tomorrow's business-as-usual.

So welcome to this new world. Please be a core part of it. ◗

Keen (peter@peterkeen.com) is chairman of Keen Education and an author and consultant. Contact him at www.peterkeen.com.

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The State of IT: 2010

A NEW REPORT from Forrester Research Inc. paints a grim picture of the future for the corporate information technology organization that we know today. "Externalization," it says, "will eliminate IT as we know it."

And that's the watered-down version. Bobby Cameron, an analyst at Cambridge, Mass.-based Forrester and primary author of the report, laughs and says he wanted to call it "The Death of IT." But Milquetoast prevailed, and it's titled "Driving IT's Externalization."

Of course, you can read "as we know it" as an escape hatch. Did MIS kill data processing as we knew it? Did the IT department in turn kill MIS? Would the predicted rise of "external information technology" (Forrester calls it "eT") mark the death of IT, or simply its logical evolution?

We looked ahead 10 years and asked: Will corporate IT be dead in 2010? Will organizations have a contract "IT guy" sitting around making sure the servers are up and the network's not on the fritz, just as they have a "maintenance guy" or a "landscaping guy" today?

Most experts say no. IT is simply too important, and the potential competitive edge it presents too vital, to be outsourced entirely. But they agree that the 2010 version of IT will look far different than today's.

This is how the Forrester scenario goes:

E-commerce has opened the floodgates by spurring businesses to open their systems to customers and partners. CIOs have underestimated the impact of this change; e-commerce, the report says, will "cause processes to diffuse both across the enterprise and among customers and business partners, challenging internal IT to keep up." This approach will eventually "hit a brick wall."

"CIOs want to keep the status quo," says Dudley Cooke, CEO of consultancy Liberty Business Strategies Ltd. and former CIO at what is now Sunoco Inc. "So many CIOs are introverted, in both [personal] behavior and in looking at the IT function as an end-all. That's not going to make the cut."

Forrester agrees in its report, which says, "IT must radically redeploy . . . to effectively support dispersed business operations."

In this new world, technologies will be diverse and fast-changing; layered architectures will rule. Interfaces will continue to get friendlier. Coupled with increased standardization, these changes will speed the trend toward do-it-yourself technology, cutting the IT department out of the loop. The organization will use a hodgepodge of thin clients, ubiquitous networks and outsourced services and applications to keep internal and external users happy.

In 2010, "we'll all use wireless handhelds," says Len Tenner, CIO at Hewitt Associates LLC, a consultancy in Lincolnshire, Ill. What operating system? "Doesn't matter," Tenner says. Others agree that the ascendancy of the network will render the operating system less significant. "But I don't see Microsoft going away," Tenner says. "They understand XML. They can't afford to be seen as the curmudgeon of the industry."

Microsoft's embrace of XML is seen by many experts as tacit agreement that Windows won't dominate the in-

IT vs. eT

Here's how Forrester Research compares today's IT organization with the "external information technology" (eT) organization of the future:

	Today's IT	Tomorrow's eT
Design focus	Support employees, add extensions for external users	Expose internal IT assets to support supply chain and customer purchases
Primary customers	Business managers and employees	Business units, customers and trading partners
Lead IT skills	Development, analysis and reporting	Integration, business liaison and project and change management
Business-process ownership	Internal stovepipe business organizations	Blurred across internal organizations and among customers and trading partners
Electronic interactions	Limited commerce activities	Rich collaboration that enables a virtual corporation
Source of project funding	Incremental IT budgets	Business units and partners
Technology value creation done by	Internal full-time technology professionals	Internal business analysts and knowledge workers; external trading partners and outsourcers

SOURCE: FORRESTER RESEARCH INC., CAMBRIDGE, MASS.

What will the corporate IT organization look like in a decade? Diverse and fast-changing technologies will cause it to look very different from the one you're working in today.

By Steve Ulfelder

dustry in 10 years. As the heir apparent to HTML, the XML standard is poised to become the underlying language of e-commerce. Where Microsoft did its level best to smother Java — the last major threat to Windows — while heartily praising it, its enthusiasm for XML appears to be genuine.

Technology predictions are, of course, especially difficult in light of the decade that just passed. Web inventor Tim Berners-Lee's spiritual children are surely brewing up technologies that will change everything.

In the future, Cameron says, "the CIO goes away. Becomes a COO [chief operating officer]. Technologist is a small part of the job. In five years, you'll be hard-pressed to find CIOs" in any industry in which multitiered companies sell configurable products and services, he says. Mature industries with longer product cycles will see slower change, Forrester reports, but the writing's on the wall.

Despite the push among IT leaders to increase their business savvy, "the CIO is now a high-class technician" in the minds of many top executives, Cooke says. "In the future, he'll really focus on IT strategy."

"The CIO/CTO will be in direct conversations with the board about business issues," agrees John C. Henderson, a professor at Boston University's Systems Research department. He points out that in the next economic downturn — which will be the *first* downturn of the Internet Age — "the focus will be on efficiency and creating new value propositions. The CIO then would have the same crunch any other manager has: Where do I cut back? How do I simultaneously reduce my budget while focusing innovation on areas most likely to have impact?"

Thus, the next recession may be the transition point at which the CIO becomes a full-fledged business executive.

Integration Situation

The Forrester point that really resonates is "integration becomes Job 1." The phrase *relationship manager* comes up in the report again and again.

"You can't outsource leadership," says Henderson. "Alliances and partnerships will need to be managed."

IT will "manage the partners and alliances," echoes Madeline Weiss, head of the Society for Information Management's Advanced Practices Council in Chicago.

The relationship-management scenario comes up so often that it's worth dwelling on. Here's how it goes: In 2010, most programming work has been pushed back to vendors (which may, in turn, hire offshore code writers on the cheap). Corporate IT is in charge of buying or renting technology modules, dispersing them to business units where appropriate, integrating them, constantly making sure the company's IT suits its business goals (which will change much faster than they do today due to shrinking product cycles and the inexorable adoption of "Internet time") and keeping other executives up to speed on both the technology itself and the competitive opportunities it presents.

Piece of cake.

IT Triumphant?

"Yes, IT will exist" in 10 years, says Jerry Luftman. "Make that a *resounding* yes. Of course, it won't be the same as we know it today." Luftman, a professor of information systems at Stevens Institute of Technology in Hoboken, N.J., spent 22 years at IBM as both an IT practitioner and a consultant.

Like other IT veterans interviewed for this story, he chuckles and reminisces when presented with the doomsday scenario.

"I've been a professor for 30 years, and this is the third time I've seen predictions that IT will go away," says Henderson. In the '70s, he says, some predicted that the rise of decision-support systems would render IT obsolete. The second death of IT was predicted during the heyday of client/server in the early '90s. And yet IT is more important now than ever. "Organizations are now in a position where if their systems fail, the organization fails," Henderson says.

Technology is so tightly woven into some industries, such as financial services, that in some cases the business *is* IT. Eric Clemons, professor of operations and information management at the University of Pennsylvania's Wharton School in Philadelphia, serves up an example. Capital One Financial Corp. in Falls Church, Va., has quickly become the most profitable credit-card issuer ever, he says. It's certainly one of the largest. Capital One uses IT to identify the most profitable consumers and passes on pecksniffs who pay their balance each month.

"Now they're doing the same thing [identifying and pursuing only the most lucrative customers] in cell phones," Clemons says. "They would say they've got a [data-processing] shop with a couple of vertical industries tacked on." It's quite a turnabout: Use IT to devise a business model first, and then simply add logical verticals almost as afterthoughts. What's to prevent Capital One, or other firms, from applying this model to other businesses, such as auto loans and mortgages?

For the most part, internal IT organizations will be smaller in the future, says Weiss, but she sees financial services companies as an exception. "They are building *up* their IT staff," she says. "IT is too strategic for them to leave it to partners."

It's fair to ask whether financial services is a bellwether industry. With the rise of application service providers, many businesses today are happy to outsource infrastructure and other non-core-competency IT functions while pouring resources into key systems that can provide competitive advantage. Some analysts see this trend continuing — and sharpening — for the foreseeable future.

Action Plan

Technology discontinuities — the unpredictables, such as the Web — invariably scramble long-range plans. ("Ten years out? Who the hell knows?" laughs Weiss.) But whatever the changes to IT may be, it's safe to predict there will be plenty of them. And that they'll come fast.

To plot your future, then, you must plot your organization's demise. Here, from the Forrester report, are some ways to do that:

- **Get external participation.** Use customers and trading partners not merely to define interfaces and processes but "to drive creative . . . interactions around shared product development."
- **Prepare for shrinkage.** The IT organization will get smaller. The need for technology won't. Look for opportunities to disperse your people into business units. This is vital for your business — and for your workers, who must leave the comfy IT shop if they're to thrive.
- **IT's last project?** Treat this migration into business units as you would any major project, with goals and milestones.
- **Ingrain outsourcing.** "Make managing outsourcers a core competency," Forrester urges — a thought echoed by several industry experts.

Will the IT organization be dead in 10 years? Depends on how you parse the words. Stone-cold dead? Nah. Dead as we know it? Could be. In the future, "the 'things' of the IT organization will be substantially diminished," Cooke says. "And it's the things part that today's CIOs focus on." ◗

LEADING-EDGE RISKS

A company can save money or gain a competitive edge by being the first to use a new technology, yet it assumes the risk that the innovation will flop. Successful IT innovators share their secrets to maximizing benefits and minimizing those risks. By Liz Horwitt

SUCCESSFUL information technology innovators are like racehorse gamblers who like long odds. They're the early implementers of groundbreaking technologies, the beta sites that start rolling out a new product before it ships, the first customers of exciting start-ups with shaky funding. Their visionary CIOs have made innovation not just an occasional last-resort practice but an intrinsic part of the corporate culture.

Being first out of the gate with an innovative technology can enable a company to realize big savings or to roll out a competitively crucial service way ahead of its competitors.

But there's always the risk of betting on the wrong horse. "You can get caught by a huge technology shift — you go one way, industry goes another, you get caught holding a bag you can never use," says Gary Habermann, director of technical resources at Widener University in Chester, Pa.

But such risks hardly deter the true IT pioneers.

"What we look at is the costs of not being an innovator," says Neal Goldstein, senior vice president of architecture and planning at Charles Schwab & Co. in San Francisco. "If we don't constantly innovate in the business and technological space, we're gone."

Goldstein's comments are echoed by many IT innovators.

"Sure, we've made a bad technical decision," says Rob Carter, corporate vice president and chief technology officer at FDX Corp. in Memphis, the parent company of Federal Express Corp. "But the good ones positioned us in the marketplace, gave us customer capabilities that more than made up for bad decisions. To me, the biggest risk is being too conservative and then getting caught flat-footed — missing opportunities."

Not that IT pioneers ignore the risk of betting on a new and comparatively untested technology. Rather, they manage it.

Unlike your typical gambler, successful innovators have come up with effective ways of optimizing their chances of backing the right horse and of minimizing the impact of a wrong choice on themselves and their users. What follows are some tips from the stable.

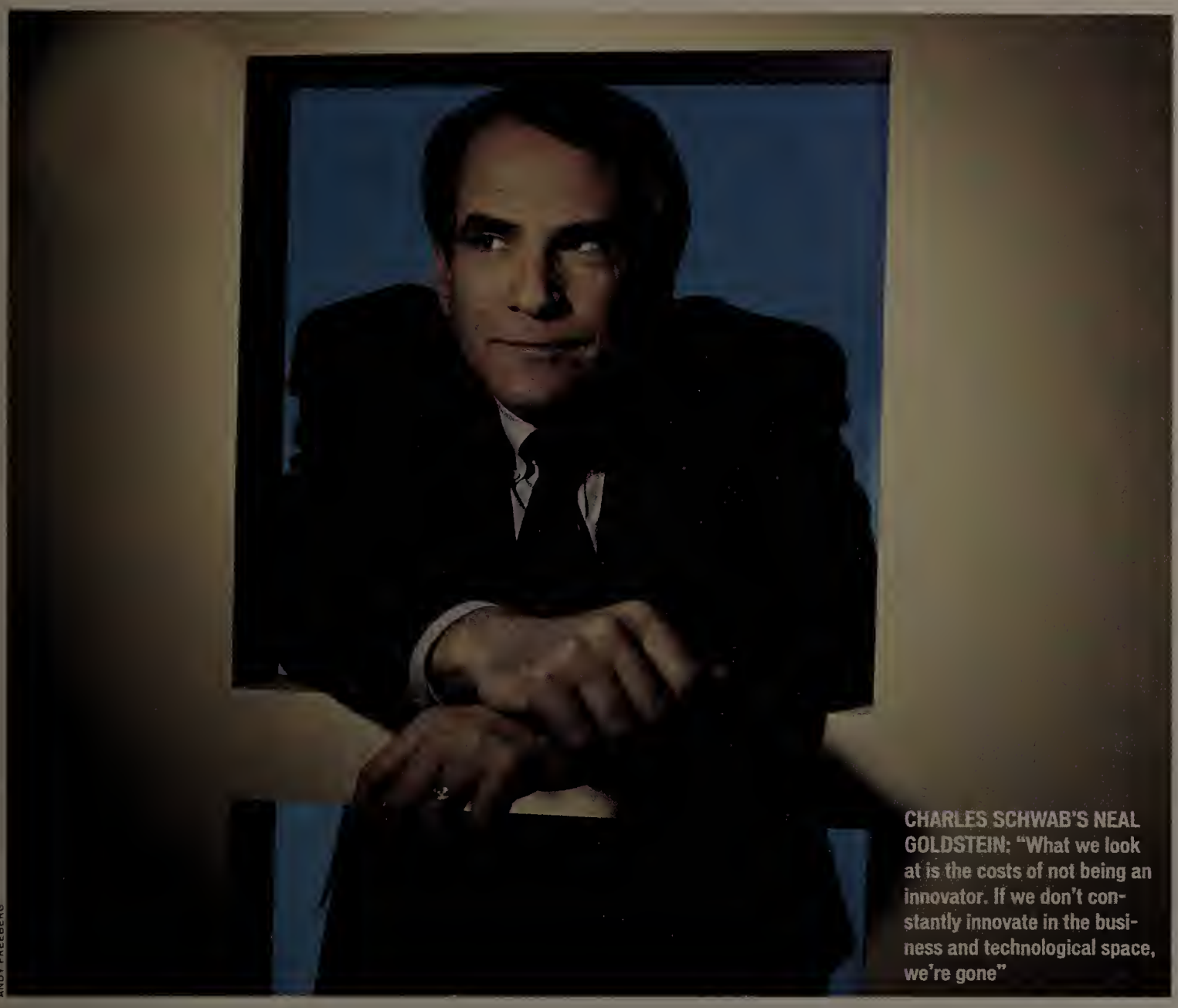
Informed Choices

As any savvy gambler knows, inside information often makes the difference between winning and losing. IT innovators scope out new technologies through various information channels: research companies, the computer trade press, vendors' annual reports and colleagues in other leading-edge companies and industries.

But when it comes to getting the lowdown on a particularly iffy new technology, Ed Risinger, president of Health Data Services Inc., a health information services firm in Austin, Texas, tends to trust *The Wall Street Journal* more than the trades. "Wall Street knew that [Integrated Services Digital Network] would cost too much for the telcos to deploy to be successful. They don't care how neat the technology is; they care whether it gets returns on investment."

It can be tough finding good information on a technology, particularly when it's "blue sky" stuff barely out of alpha testing. Analysts may still be getting up to speed; existing sites may be scarce or in very early stages. Sometimes you have to be your own expert on a buy/not-buy decision.

Such was the case when New York-based Ernst & Young LLP first implemented Lotus Notes, when Widener committed to Asynchronous Transfer Mode, when Schwab took a flier on the Open Software Foundation's Distributed Computing Environment and



ANDY FREEBERG

CHARLES SCHWAB'S NEAL GOLDSTEIN: "What we look at is the costs of not being an innovator. If we don't constantly innovate in the business and technological space, we're gone"

when Media News Group Inc. had to choose between Java and ActiveX.

Media News Group, a Denver-based national news chain, was shopping for Web development tools when the two products were apparently locked in a life-or-death struggle, according to Kevin Hamilton, CIO and chief technology officer. "One of the things that makes technology work is your peers using it, so you can help each other out. We were pretty much alone," he notes. Hamilton says the company couldn't afford to wait six or eight months to see who came out on top. So he went with both, which turned out to be the right decision, since both Java and ActiveX ended up flourishing.

Innovators frequently face the same kind of dilemma as Media News. So many things can go wrong; so many promising products end up fizzling. The market may go in a different direction. A powerful competitor comes up with an equivalent offering. Your vendor may go out of business or decide to make a 180-degree change in strategy. Or the product may simply fail to live up to its potential, at least for your needs.

You can't do much to influence market forces, you just have to watch them closely and be ready to respond to changes quickly, innovators say. But IT departments can, and should, try to influence the vendor. And one of the most effective ways is to form a partnership with one. Vendors are often more than willing to do so, particularly if you're a big corporation with extensive testing resources. And the rewards can be great. As a partner, you get to test products early, often with the on-site help of the vendor's engineers; plus, vendors generally listen when you request new features or capabilities because you represent the market to them.

Keep Your Options Open

Of course, it doesn't pay to get too closely tied to a particular vendor or product. Eventually, you'll need to extricate yourself. Even if the product isn't a lemon, true innovators say they are always looking for the next great idea. So you'd better have some flexibility built into your contract with the vendor and into your architecture, they warn.

Yet if the product or technology does turn out to be problematic, the ability to back out becomes crucial. That's why you need a plan to fall back on — and not one made up on the spur of the moment.

"The project plan needs to specify: What are you going to use if this doesn't work?" says Schwab's Goldstein. "You need a second strategy that's still workable and not a $5 million solution for a $4 million problem."

Ideally, you get the vendor's agreement in writing to help you switch to your chosen alternative if the product doesn't pan out. "You have to have a contract or agreement in place: 'If the following events occur, you will help us get to this point using this more established, alternative technology,' " says Widener's Habermann. "We've done this with all our innovative projects."

Damage Control

Managing the risk of innovation means protecting your architecture and users from the consequences of a wrong decision. The traditional way of doing this is by testing the product thoroughly before rolling it out to users.

But it's impossible to predict exactly how a technology will behave under real business conditions, particularly if it's innovative. That's why it's a good idea to get users involved in an innovative project early, letting them know of potential benefits and potential problems.

"We create an awareness with users, the ones who will be hit most if a technology fails," says Ulrich Seif, CIO at Santa Clara, Calif.-based National Semiconductor Corp. "When we rolled out a thin client two years ago, users knew it wouldn't work out right away, that we'd have to fine-tune the network, but that it would save the company about $30 million a year."

Staying in touch with users' needs can save IT from the classic mistake that probably causes more wrong choices than any other: falling in love with the technology for its own sake. This happened to the IT department at Reinsurance Group of America Inc. in St. Louis. "We tried to build a Web-enabled global contact management system that really pushed the envelope on application design," reports Rick Nolle, vice president of information systems. "We basically got enthralled with the cool technology and didn't spend enough time talking to users; so when they saw it, they said, 'This is ridiculous, why are you showing it to us?' "

Finally, don't be too ready to write off an innovative technology just because it doesn't pan out right away. Any number of developments can eventually turn a lemon into a peach: The technology (and the market) can mature, for example, and so can your users. And best of all, you can get some use out of all that training and development you invested in the first time around.

Indeed, perhaps the most important advice experts have about innovation is: Treat it as ongoing, not a one-time deal. Says John Voeller, chief technology officer and chief knowledge officer at Black & Veatch, an international engineering and construction firm in Overland Park, Kan., "You need a process where you keep adjusting [to a continually changing situation], not a place where you feel comfortable."

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The Factors Behind IT Innovation

Some of these factors can come into play when making a buy or pass decision on new technologies:

- Does the technology or product meet a need that nothing else fills?
- How critical to the business is the application or system it applies to?
- What existing system elements will this technology interact with? What elements will depend on it and be affected if it fails?
- How big is the potential payback from the technology?
- What IT resources do you have set up to deal with problems or to fill gaps?
- Will the product be implemented corporatewide or for one division or group?
- What are your facilities for pilot testing and simulating new technologies? Are they extensive enough to make you an attractive beta-test site for a leading vendor? – *Liz Horwitt*

ANNE McCRORY/JARGON JUDGE

Ban ugly language shortcuts 4ever

Y2K MEANT DIFFERENT THINGS to different people. Guess what it meant to me? Let's call it "the ugly acronym."

Oh yes, I bought into it. There was no way not to. Fortunately, once the popular media adopted it, people generally knew what it meant. Even my parents wondered about it. "What is it about this K2Y thing, anyway?" my dad asked a couple of years ago. So when a term is understood — even when garbled — I by and large have no problem using it.

But Y2K should be viewed as an exception to the rules of acronyms, initials and abbreviations, because it doesn't follow convention. In fact, it thwarts it, being a conglomeration of numerals and letters, not all of which directly correspond to the words they represent. Let's stop with Y2K, before other expressions follow suit and our language becomes a bizarre mix of characters appealing mostly to people accustomed to electronic bulletin boards.

Consider what Y2K actually is. We have *Y*, which stands for year. We have *2*, which in fact means the number 2. Then we have *K*, which doesn't stand for the word it represents — that would be a *T* — but instead is a commonly known abbreviation for thousand. So, Y follows the rules, 2 is a number and K stands not for *kilobits* or *karats* or *kangaroos* but *thousands*. A real mishmash.

Meanwhile, use of the numeral 2 has entered our acronym world elsewhere — not meaning *two* but *to*. We can probably blame the aforementioned bulletin boards for that, where members talk about having F2F (face-to-face) meetings and otherwise use *2* as a stand-in for the preposition. In the business world, this usage has crept into phrases such as B2B (business-to-business) and B2C (business-to-consumer), which are usually used in reference to e-commerce. So, here we have a disconnect, with the *2* as established in *Y2K* meaning a number and the *2* used elsewhere meaning *to*.

Does any high-tech jargon leave you steamed? Or smiling? Tell ANNE McCRORY, former *Computerworld* copy desk chief and now news editor. Contact her at anne_mccrory@computerworld.com.

Another natural number to be co-opted in this way is 4, which, so far, isn't in many business terms but is the preferred "spelling" of the preposition *for* in chat groups. Do we really want to be known as the nation that goes around asking, "R U ready 2 C me 4 T?"

So thanks, folks, for introducing that shorthand. But let's exercise some restraint and stay away from it. Let's make Y2K a one-time thing, in all senses of the term. ◗

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MARKETING YOUR OWN

Got a hot idea of your own for an IT product? Your employer can wind up as friend or foe, depending on how you handle matters.

By Joanie Wexler

TODAY'S cybercentric economy is fueling IT innovation left and right. Any day now, it might be your turn to bolt awake in the middle of the night with your own technology idea and yell, "Aha!"

If you're receiving a paycheck from a permanent employer when your breakthrough idea strikes, you must tread carefully to protect your idea so you can profit from it. You have several ways to gain from your idea, all of which carry a common underlying theme: Obtain solid legal advice at every turn.

The first thing you must do is check your employment contract to see if you have signed away invention rights to your employer, says Marc Blatt, principal at the Law Offices of Marc Blatt in Los Angeles.

At a minimum, if you think you want to market your idea or prototype on your own, it's important that you conduct your development exclusively on your own time using only your own resources. The minute an employer finds an e-mail or a fax that relates to the idea, the strength of your case for ownership will founder, Blatt says.

In addition, different states have different laws that you should investigate. You can generally do this by checking the labor laws on a state's Web page. In California, for example, where information technology innovation is rampant, inventions are protected by the California Labor Code and are patentable by the employee, provided that you abide by the do-it-on-your-own-time rule. In many other states, however, employers own anything employees think up, create or develop while in their employ.

Before blabbing about your brainchild, then, it makes sense to take your employment contract to an intellectual property attorney. If you discover that chances are strong that you do indeed own the rights to your idea, you have several options for profiting from it.

Market It Yourself

The development, production, marketing and sales strategies you use will depend to a great extent on the complexity of your specific idea, says Evan Brown, a computer programmer in Cranfills Gap, Texas. Brown is currently in litigation with his former employer, DSC Communications Inc., over ownership rights to an idea Brown says he came up with for simplifying Y2K

Protecting Your Source Code

Independent programmers often bring their software tool kits with them when embarking on a new project. At the end of the day, the tool kit has changed and there's a blend of old, new and reusable code. Who owns what?

In such cases, says Marc Blatt, principal at the Law Offices of Marc Blatt in Los Angeles, programmers should strongly consider seeking the help of an intellectual property protection services company that serves as a trusted third party. The trusted third party will deposit a snapshot copy of the tool kit in its original form in source code escrow. Various snapshots in time can be deposited to create a traceable, time-stamped record differentiating between the pre-existing tool kit and code developed later.

In the event of a dispute, a qualified arbitrator or other neutral intermediary can compare a copy of the deposit from the escrow company with the current version of the code as developed during the term of the programmer's engagement. The snapshot/escrow approach makes it relatively straightforward to resolve arguments as to whether source code revisions were created by the programmer prior to or after termination of the contract.

Here's a sampling of some software escrow companies:

DSI Technology Escrow Services, San Francisco (*www.dsiescrow.com*)
Fort Knox Escrow Services, Atlanta (*www.fortknoxescrow.com*)
Lincoln-Parry SoftEscrow, Englewood, Colo. (*www.softescrow.com*)
Software Escrow Corp., Atlantic Beach, Fla. (*www.softwareescrowcorp.com*)
SourceFile LLC, Los Angeles (*www.sourcefile.com*)

– *Joanie Wexler*

software conversions while in DSC's employ more than two years ago. The idea did relate to Brown's job description, which is what all the legal hullabaloo is about. Brown didn't make it to the point where he got to market his idea — it never got developed because it was stalled when he presented it to his superiors at DSC.

"The bigger or more complicated the idea, the more resources will be required to deliver a final product," Brown says. "If a person finds that they need to join forces with others, they should by all means get proper legal advice before even disclosing the details of the idea."

When Kathleen Funkey in San Diego was an independent programmer several years ago, she wanted to publish so badly that she "had a blind eye" about the legalities of how to protect her intellectual property, she says.

ANDREW YATES

GET LEGAL ADVICE before disclosing the details of your idea, says Evan Brown, who's embroiled in a dispute with a former employer

She had formed a two-person business partnership under which it was her job to develop a spreadsheet-based software application and her partner's responsibility to market it. Funkey was to earn sales royalties. Her partner didn't live up to his end of the bargain, says Funkey, so she broke off the partnership, developed a new product and went into business for herself. She says she was more than a little surprised when her former partner decided that he was entitled to the rights to that software too, and took her to court.

"The second program had nothing to do with the first," says Funkey. She ultimately won the lawsuit but endured years of litigation and went so far as to get a law degree after the experience. In addition, she says, her former partner had access to her source code and he reused pieces of it, which left her work seeming unoriginal.

For such situations, Funkey recommends that programmers put their source code into a third-party escrow to eliminate any question about the state of the original code and restrict inappropriate use of their work (see "Protecting Your Source Code," previous page).

Funkey says she was naive because an earlier employer, Hewlett-Packard Co., had a "right of first refusal" program in place, and it had worked well. This meant that if an employee developed something on his own time, HP could elect to market it and give the employee a cut of the profits.

Partner With Your Employer

Like HP, many IT employment contracts include a right-of-first-refusal clause. Provided you consider the financial arrangements to be fair, leveraging the development and marketing resources of an established company can be the least complicated and most economical road to profit. On the other hand, if you don't strike a savvy deal, you could wind up like the beleaguered members of the cast of *Gilligan's Island*, who have been bemoaning the lack of rerun royalty provisions in their TV contracts for about 30 years.

The case of Brown vs. DSC, in fact, has reached a stony impasse because Brown didn't like the terms offered by his company. When he told DSC management that he had a revolutionary idea for Y2K conversion tools, Brown says the company offered him what he considered an inferior sum for the rights. Brown has never disclosed the specifics of how his software would work and he continues to refuse to divulge the details despite a court order to do so. The case remains in the discovery phase with no trial date set.

Dot-com It

The Internet is the Wild, Wild West for patents, and if you can come up with something Internet-related quickly, chances are good that it is patentable. The number of Internet-related patents issued in 1998 increased by more than 100% from 1997, according to the U.S. Trademark and Patent Office.

One quick way to cornering a market is to "Webify" an existing function or business process and apply for a patent. This type of patent activity was sanctioned last January in a landmark Supreme Court decision (State Street Bank & Trust Co. vs. Signature Financial Group Inc.) that established that business methods and software can be patented.

Whatever you do, at the end of the day "it is best to have a written agreement that strictly defines your job definition," says Blatt. "As a general rule of thumb, it is very unwise for employees to leave things to chance and hope to retain ownership rights." ◗

Wexler is a freelance writer in Campbell., Calif.

IDEAS

FINANCIAL & BUSINESS CONCEPTS IN BRIEF

Risk Management

BY MARK HALL

IN 1654, when people hand-wrote letters instead of subscribing to e-mail list services, Blaise Pascal and Pierre de Fermat exchanged missives that established the basic principles of probability and ushered in the notion of risk management. Pascal's motive was to gain an edge in gambling, but he unwittingly helped improve a CIO's odds at venturing into new operations, such as e-commerce, as much as lending a hand to a chief financial officer's investments.

Risk management is a venerable tool in finance. Bankers have long used risk-management techniques to determine whether you're creditworthy of a home or business loan. One of the most basic tenets in taking risk for a bank is to assure that the officers who sell loans aren't the same ones who approve credit. And they're rewarded accordingly: loan officers for loans approved, credit officers for sound loans.

"Historically, when financial institutions thought about risk, they focused on credit risk," says Bob Kafafian, chief advisory officer at Lancaster, Pa.-based Hopper, Soliday, an investment banking and brokerage division of Tucker Anthony Inc. in Boston. But that has changed dramatically, he says. Risk is understood to be everywhere in business, finance, information technology and just getting out of bed in the morning.

DEFINITION

Risk management is a process that helps determine an organization's exposure to risk in areas such as finance or technology. It is then used to minimize, control or eliminate the risk exposure. For example, IT managers can follow risk-management procedures to gauge security concerns on an e-commerce site.

"We live with an uncertain future," says Randy Payant, vice president and director of research at the IPS-Sendero Institute in Scottsdale, Ariz. "The difference between uncertainty and risk is that you can quantify the impact of risk but not uncertainty."

Complexity of Risk

The complexity and pervasiveness of risk make it critical for executives to be aware of it and to have ways to identify and control it. For example, Kafafian says, banks need risk-conscious executives managing more than a loan portfolio. He says most good banks apply risk-management techniques throughout an enterprise, evaluating everything from complying with regulators to Y2K conversion work. He says even human resources and marketing departments must be prepared to handle risk, from choosing marginal employees in difficult hiring times to launching controversial advertising campaigns.

Misjudging risk in any area can be crippling, he says. For example, when Victoria's Secret was planning to air a commercial during last year's Super Bowl, the company's IT team didn't conduct a risk-management analysis of what effects advertising to the world's largest audience of men would have on its Web servers. As a result, systems were overloaded and the company suffered a loss of orders and a public relations disaster.

IT always has operational risk issues. But IT professionals also have to be aware of risk in another area, one that's particularly hazardous in these days of e-commerce. "CIOs don't have to worry about financial risk, but they have to be concerned with data security," Kafafian says.

Stephen Pozgaj, CIO at Mackenzie Financial Corp. in Toronto, says he agrees but points out that more than data security is involved. "IT risk management encompasses everything," he says.

Last month, Mackenzie officially recognized the importance of overall IT risk management when it broadened the charter of its Security and Standards Committee and renamed it the IT Risk Management Committee. Pozgaj says IT management involves a steady diet of managing risk. "To think that one would conduct one's affairs without risk management would be foolish," he says.

> When you had a closed data center, that was a castle. It was a lot easier world to manage.
>
> EMILY FREEMAN, SENIOR VICE PRESIDENT FOR E-BUSINESS, MARSH INC.

Pozgaj says moving an operation onto the Internet using open systems creates greater business opportunities than adopting a closed technology. But he also says it raises the stakes for data security. "Open systems are a double-edged sword," he says. In an e-commerce application, you have to be particularly vigilant, Pozgaj says, because "the bowels of your systems are open." Protecting customer data becomes more complex when outsiders conduct business directly on your computers.

Risk-management principles, he says, are key to defining policies and procedures in the area of keeping data secure through managing multiple levels of access controls for thousands of users. Applying risk-management principles to data-security procedures also means implementing effective authentication and authorization processes throughout the network and within applications. Risk management is an unending program, Pozgaj says.

Emily Freeman says she agrees. She's the senior vice president and national leader for electronic business at New York-based Marsh Inc., which consults and insures businesses. "When you had a closed data center, that was a castle. It was a lot easier world to manage. Once you open the environment up, you have a lot more exposure," she says.

But "ultimately, information security is not about technology. Technology is only one element," she adds.

When Freeman consults at an e-commerce site, the first thing she wants to see is the company's data security plans. "I look at a company's policies and procedures as much as I do a firewall," she says.

Detailed Policy

She says she applauds initiatives like Mackenzie's Risk Management Committee and adds that the more detailed the data security policies and the better the oversight procedures, the more risk an insurer is willing to shoulder. The more risk an insurer will cover, the more flexibility management has in business decisions.

A common problem Freeman encounters is when a traditional company embraces online business. "When brick-and-mortar moves to brick-and-click, they forget that their old insurance does not take the Web into account," she says.

Organizations that permit confidential information, such as private customer data, to be accessed online had better apply rigorous risk-management techniques to data security, Freeman says. "It's not just about protecting yourself from lawsuits. You could lose the confidence of your customers. Your public image is at stake," she says.

Steps to Managing Risk

Randy Payant, vice president and research director at the IPS-Sendero Institute, a risk-management education and training group in Scottsdale, Ariz., says risk management is a fourfold process:

1. **Identify risk-prone areas.** For example, in a supply-chain network accessed by your vendors, you'll need to locate every point of entry, servers, available applications and numerous other vulnerabilities. Once they are identified, you can determine the levels of risk your organization is willing to take at each point, such as whether you want to allow all employees at a given vendor in your supply-chain network access or only a select few.
2. **Measure or quantify your exposure.** How many ports can be accessed remotely? How many external users will there be? What levels of access will be permitted?
3. **Limit the factors that contribute to risk.** Reduce the number of people with access rights. Restrict hours of availability for systems.
4. **Control your realm.** Create and monitor IT procedures.

■ *Are there business terms you would like to learn about in QuickStudy? Please send your ideas to quickstudy@computerworld.com*

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Dear Career Adviser:

I'm 50 and manage a data center for a large government entity in Texas with over 5,000 employees. I have owned and managed several computer-related businesses and have a strong accounting background. I noticed on CNN recently that many start-ups are hiring "adult supervision" to manage young companies. How would I explore such opportunities?

— INTERNET WANNA-BE

Dear Wanna-be:

"An e-commerce company might need a data center manager at a director level to manage network operations," says Larry Phillips, a venture capitalist at Primedia Ventures in New York. However, your government and large-systems background and experience could make this transition pretty daunting.

Remember, "older" people come into younger companies generally as founders or backers, sales experts, deal makers or board members. Rarely do they jump from the government IT world to become hands-on managers within Internet start-ups.

"Like most Internet companies, our senior veterans come with business and technological backgrounds and contribute as investors or board members or on issues of product definition, finance and marketing rather than in the daily routine," says Oded Vardi, a founder of RUSure.-com, a popular Internet comparison-shopping site.

While start-ups sometimes hire more experienced, ergo older, people for senior hands-on technical management roles, interviews for these jobs can be grueling.

Focus on showing your ability to report to a younger senior manager and to collaborate with young teams and how your technical skills can help avoid pitfalls and get a good product out the door faster. You will absolutely need this hands-on credibility before you interview, so start doing lots of homework now.

Dear Career Adviser:

I'm a 40-year-old software/systems engineer with a computer science degree from Georgia Tech and initial work experience at a software company that specializes in Defense Department satellite command-and-control applications. In 1992, I joined a consulting company that specializes in intelligence systems.

I have written software for space-based, ground station and contract management applications and now provide engineering services in support of major program acquisitions. I currently earn over $100,000 a year. Can I compete in commercial IT at this salary in analysis, design and project management positions? What business areas and IT positions I should focus on?

— BUSINESS BOUND

Dear Business:

"While your skills and experience are certainly transferable to the commercial world and the need for this skill set is great, you need to understand that you probably would not immediately receive a $100,000-plus salary in the commercial world," says Larry Keith, president of EDSL Networks, a company that specializes in high-speed Internet connectivity.

Here, then, are some transition steps that will get you there over time:

FRAN QUITTEL is an expert in high-tech careers and recruitment. Send questions to her at **www.computerworld.com/career_adviser.**

First, investigate consulting companies that have opportunities in your field but probably at lower starting salaries. Or consider branching out into the manufacturing world in a sales support or systems engineering role. Also think about taking on a tech support role. If you can persuade a high-profile company with good technology and possibly some upside stock option potential to hire you, and stay flexible on compensation for the moment, you'll be just fine.

Dear Career Adviser:

I have more than seven years' experience in IT, five of those as a computer technician and two as a network administrator. I work for a 500-person manufacturing company that has just implemented SAP R/3.

I have six to eight months experience in Basis administration on an AS/400 platform and see myself soon becoming an SAP R/3 Basis administrator/consultant. Is there a class or other training that would help me reach my goal sooner? What about salaries?

— SAP SAMANTHA

Dear SAP:

Of four different SAP skill sets — Advanced Business Application Programming (ABAP), functional consulting, New Dimension/e-commerce applications and Basis — "Basis is and has always been the skill set that was the least required," says Ralf Schundelmeier, SAP program director at CrossWorlds Software Inc. in Burlingame, Calif. "And the fact that this candidate is working on AS/400 is not as valuable as [Windows] NT or Unix."

Since the highest immediate demand is for functional consultants who know the new SAP e-commerce applications and for technical people who know the "Internet framework," your best bet would be to learn ABAP, C++ or Java, according to Schundelmeier. ◗

BRIEFS

Acquisition Mode

IT Factory Inc., a Cambridge, Mass.-based maker of Notes and Domino business objects, has acquired Corporate Image Software Inc. (CIS). CIS, also in Cambridge, develops software components and tools for Domino-based e-commerce systems. Acquisition terms weren't disclosed.

Claims Data Access Available via Web

Workers' compensation care-management company ManagedComp will be using Brio.Portal from Brio Technology Inc. in Palo Alto, Calif., to develop a Web site for its 5,000 customers to access claims data via a Web browser. Waltham, Mass.-based ManagedComp's customers include property and casualty insurance firms, insurance brokers and employers who want to access workers' compensation claims data.

NexStep Management For OnlineToy Retailer

LearningExpress.com, an online venture of Learning Express, an Ayer, Mass.-based specialty toy retailer, has selected NexStep Inc. in Plano, Texas, to provide fulfillment and transportation management for its online retail business.

New IBM Partnerships

IBM announced two partnerships for building wireless Web applications, including an agreement with British firm Vodafone AirTouch PLC to build, manage and run a global Internet portal for wireless devices scheduled to begin operating in July. IBM is also working with Schaumburg, Ill.-based Motorola Inc. to build technology to bring wireless Web-based services to automobiles for use by drivers and passengers.

Order Fulfillment

Oxmoor House, a Time Warner Inc. subsidiary and publisher of publications such as the *Southern Living* and *Cooking Light* cookbooks, has chosen Sapiens Americas in Research Triangle Park, N.C., working with IBM, to provide an order-fulfillment system. Sapiens will develop the order-processing and inventory application. Tampa, Fla.-based IBM Global Services conducted an evaluation process for Oxmoor House to determine that Sapiens' product would be an effective application for this project and is now in the process of implementing the system for Birmingham, Ala.-based Oxmoor House.

Schools to Offer Online Programs

Internet learning company Unext.-com in Deerfield, Ill., has signed the business schools at the University of Chicago, Columbia University, the London School of Economics, Stanford University and Carnegie Mellon University to deliver online programs. Unext will work with the schools' faculties to develop online degree programs and finance course development costs. Chicago, Columbia and Stanford have each received a $1 million sign-on bonus.

Car Buyers Get Greenlight.com

Newly launched Greenlight.com, based in San Mateo, Calif., is one of the first sites to let customers purchase a car online. Site features include side-by-side comparisons and the ability to pick features and options. The site is backed by venture firm Kleiner Perkins Caufield & Byers and Asbury Automotive Group, a network of new car dealerships. Greenlight.com is currently available in Greensboro, N.C., and Jacksonville and Orlando, Fla. The site will expand nationally this spring.

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TECHNOLOGY

CREDIT WHERE CREDIT'S DUE

Faced with the high cost of maintaining applications at customer sites, a credit bureau in the Dominican Republic successfully uses thin-client applications to ease customer access to its databases. ▸ 64

LOTUSPHERE 2000 PREVIEW

Messaging management and Web application tools will take center stage at the Lotusphere 2000 conference in Orlando this week. But a search technology company and an information provider will also make a bid for the limelight. ▸ 66

AN INTRANET TAKES FLIGHT

Looking beyond the Asian economic crisis and the year 2000 rollover, airline Cathay Pacific expands its intranet to provide mainframe access for all of the company's 7,000 employees worldwide. ▸ 64

HANDS ON

Computerworld senior reviews editor Russell Kay takes a look at a range of products aimed at making work more comfortable or just more productive: two multifunction copier/printer/scanners, a pack of ergonomic mice and keyboards and a nifty new software utility that combines Web searching with a large built-in reference library. ▸ 70

TCP/IP: THE WAY THE WEB WORKS

TCP/IP rules modern networking, from home networks to the Internet itself. Its strengths — and weaknesses — have shaped key IT management practices. This week's QuickStudy looks at the history behind TCP/IP and why it's so important in the Web world. ▸ 72

ACTIVE DIRECTORY: YES OR NO?

Active Directory — Microsoft's answer to Novell Directory Services, Lightweight Directory Access Protocol and just about every other method of classifying users and resources — hits the streets next month when Windows 2000 debuts. We asked Windows 2000 expert John Enck at Gartner Group for his advice on when (or whether) IT shops should plan to adopt this most complex of directory services. ▸ 74

RIGHTNOW SPEEDS ONLINE SERVICE

There are dozens of ways to fail your online customers. One of the worst is failing to respond quickly to their queries. Start-up RightNow Technologies sells tools to help automate online customer response systems by building — and constantly updating — a huge knowledge base of the right answers. ▸ 76

MORE
Emerging Markets..... 80

THE SILICON SANDBAR

FRAZZLED INFORMATION TECHNOLOGY PROFESSIONALS are heading to Cape Cod, Mass., in search of a more relaxed pace. A wave of entrepreneurs is settling on the Cape, creating a new nickname for the area: the Silicon Sandbar. But life on Cape Cod isn't all fun in the sun; there are some drawbacks. Public schools aren't all they could be, there are limits on building expansion, and the pace of life isn't for everyone.

80

BRIEFS

Lucent Gear Purchase

Business communications provider Networks Plus Inc. in Quincy, Mass., will purchase $50 million in optical networking equipment from Lucent Technologies Inc. in Murray Hill, N.J. Network Plus said the equipment will be deployed to link 220 projected co-locations in Cambridge, Mass., New York, Miami and other areas. According to Lucent, the equipment, its WaveStar OLS 400G optical networking system, has a capacity of up to 400G bit/sec.

CrossWorlds Connector

CrossWorlds Software Inc. in Burlingame, Calif., has added an XML-based connector to its line of application integration tools. The new tool lets users send data from one application to another via XML, a content-tagging language that's emerging as a standard for exchanging information stored in different formats. The XML connector works with CrossWorlds' integration hub software, which typically starts at about $250,000.
www.crossworlds.com

Navision SQL Server

Navision Software A/S, a Danish business applications vendor with U.S. headquarters in Atlanta, this month made its financial software available with Microsoft Corp.'s SQL Server 7.0 database. SQL Server is being offered as an alternative to a proprietary database that Navision sells with the finance applications. The company said pricing will be the same no matter which database users choose. Support for SQL Server will be built into Navision Financials 2.50 and later releases.
www.navision-us.com

Integration Growing

Gartner Group Inc. in Stamford, Conn., this month estimated that sales of enterprise application integration software totaled $420 million last year, up from $250 million in 1998. Gartner also predicted that the integration business will grow 90% this year to about $800 million. For users, though, the choices can be dizzying: Gartner counted more than 25 vendors that are marketing different forms of integration tools.
www.gartnergroup.com

Thin-Client Apps Give Credit Where Credit's Due

Credit bureau finds Web-based system cuts cost of maintaining, installing applications

BY ROBIN ROBINSON

ASDRUBAL Pichardo inherited a great idea that quickly turned into a nightmare.

After spending three years educating financial institutions and consumers so they would accept the Dominican Republic's first credit bureau, Pichardo said the bureau's growth was threatened by the rising cost of maintaining applications at customer sites linked to the bureau by dial-up lines.

Using Web-based, thin-client applications, the Credit Information Center of the Americas in Santiago has slashed the time needed to update applications from two hours to five minutes, says Pichardo. It also handles 80,000 queries per month, compared with 20,000 per month a year ago, with virtually no downtime.

Big Savings

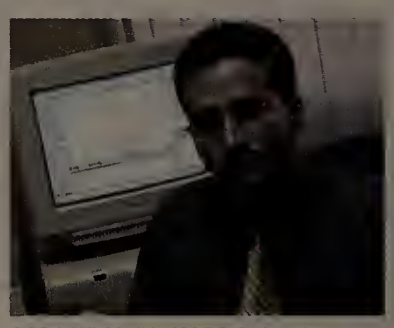
The major advantage of the thin-client approach is that it cut the cost of supporting the query and reporting software that runs at customer sites. Through each of five major releases, Pichardo's team had to visit every bank or finance company to install the new version, even configuring modems so that users could dial in. "It was terrible, but that was the way you had to go," Pichardo said. It was also expensive for clients, who were forced to pay for dozens of telephone lines.

For these reasons, the credit bureau began moving the application to the Internet last March. First, it installed dedicated leased lines between the company and its major clients — the eight largest banks in the country — and set up an extranet so any customer could link to its database via an Internet browser.

Second, the credit bureau rewrote the existing query and reporting applications to run in a thin-client architecture, sticking with the existing Cache database from InterSystems Corp.

Pichardo's team wanted an open, flexible platform that could accept input from the many systems running at customer sites. That ruled out mainframes and IBM's AS/400 as well as PC servers, he said, explaining that he felt those systems weren't reliable.

Initially, the credit bureau ran the applications on an IBM RS/6000, but it's switching to a Sun Microsystems Inc. server this month, said Pichardo, explaining that the Sun server is less expensive and the support available for it locally is better.



ASDRUBAL PICHARDO: It takes only minutes to update applications

He said he chose the Cache database from InterSystems because updates to credit records involve many changes to only a segment of the customer data, which he knew Cache could easily handle.

Although approximately 30% of his client base still uses conventional, thick-client-based applications, the thin-client approach has cut Pichardo's support costs.

"Before, it took two hours with the user to install [a new version of] the application. Now, it's only minutes, and I don't have to go [to the customer's site]. We just say 'Go to this page,' and many users are used to that; they're already familiar with the Internet," Pichardo said.

By June, he plans to have all his customers accessing the database via the Web. However, he still plans to keep dial-up access available in case of disaster, such as the hurricanes that often hit the Caribbean.

Beyond offering his team the satisfaction of solving a technical challenge, Pichardo said the project resulted in an improvement in the credit bureau's ability to allow consumers to borrow at reasonable rates by making information about their creditworthiness easily available. ◗

JUST THE FACTS

Taking It To the Web

User: Credit Information Center for the Americas

Problems: Rapid growth and time-consuming site visits to install software and train customers.

Solution: Moving the application to the Web eliminated site visits for upgrades and reduced training time.

Tools used: Unix, a Cache database and an internally developed application for collecting data and generating reports.

Results: Now reliably handling more than quadruple the number of credit reports handled using previous system, with no unplanned downtime.

Cathay Pacific's Intranet Takes Flight Worldwide

Aims to standardize mainframe access

BY STEPHANIE SIM
HONG KONG

Cathay Pacific Airways Ltd. is extending its corporate intranet — IntraCX — to its 7,000 employees worldwide through a deal with Attachmate Corp., a supplier of mainframe host access software in Bellevue, Wash.

Cathay Pacific said it has been running its corporate network on various platforms for more than seven years, but it's now standardizing the system, which is used to access its IBM and Unisys Corp. mainframes.

The Hong Kong-based airline didn't disclose the total cost of the intranet consolidation, although Attachmate said it cost "millions."

"We required a one-vendor solution . . . that will enable our staff to access our mainframe systems anytime, anywhere via the Web," said Jessica Cheung, manager of information technology planning and architecture at Cathay Pacific.

Cheung added that Cathay Pacific expects to standardize the host-access service across the organization this year.

"Cathay is the first airline in Greater China, and possibly the region, that [provides] enterprisewide access to every function available on their mainframe," said Shriram Chaubal, an Attachmate sales manager.

IntraCX provides staff members with real-time access to the company's mainframes as well as self-service applications online. Tasks they can perform via IntraCX include ordering staff discount tickets, submitting leave application forms and checking work schedules.

According to Attachmate, 2000 will be a big year for the enhancement of information technology at airlines.

During the past few years, airlines have been busy preparing for the year 2000 rollover and dealing with regional economic woes, Chaubal said. "Pulling out of the regional crisis, they're now seeing the requirement to go with Java-based intranets." ◗

Sim writes for the IDG News Service in Hong Kong.

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AGENDA

9–12:20 MORNING SESSION

- **Introduction and Welcome** *Vicki J. Brown — Senior Vice President, Worldwide Operations and Marketing*
- **eBusiness 2.0: Defining the New Online Enterprise** *Frank Gens — Senior Vice President, Internet Research*
- **ASPs: Doing Business on the Brink of IT Industry Disruption** *Clare Gillan — Group Vice President, Applications and Information Access Research*
- **Hardware Evolution: Mapping the New Order** *Crawford Del Prete — Group Vice President, Computers, Components and Peripherals*
- **Defining the New Online Economy** *John Gantz — Senior Vice President and Chief Research Officer*

Session A 1:45 - 2:25	Session B 2:35 - 3:15	Session C 3:25 - 4:05
TRACK 1: Internet		
eCommerce 2.0: New Buyers, New Brands, New Rules Barry Parr	**eCommerce 2000: The New Requirements for Survival** Sean Kaldor	**B-to-B eCommerce 2.0: What's Going On at the Heart of the Revolution?** TBA
TRACK 2: Devices		
The Revolution in PC Business Models Roger Kay	**The Next Wave in Consumer Devices and Peripherals** Bruce Stephen	**Critical Technologies Shaping the Future of Personal Systems** Randy Giusto and Mario Morales
TRACK 3: Enterprise Management		
Linux Servers and Appliance Servers: Can Toasters and Penguins Run a Network? Michelle Bailey	**Servers for the New Business Models: The Engines of ASPs, ISPs and Hosted Services** Martin Hingley	**The Server Business 2.0: Transformation of the Basics** Debra Goldfarb
TRACK 4: Software		
Microsoft Versus the Open Source Community: A Battle of Titans Dan Kusnetzky	**Knowledge Management and Enterprise Portals: Contradictory or Complementary?** Henry Morris	**Winners and Losers in the Stampede to Application Integration** Steve Hendrick
TRACK 5: Delivering Solutions		
eSupply-Chain Services: Linking Technology Innovation to Competitive Advantage Christopher Hoffman	**Taking Customer Relationship Management to the Next Level** Katrina A. Menzigian	**The ASP as a Service Company: What Does It Take to Build a Successful ASP Business?** Meredith Whalen
TRACK 6: Communications		
Interprise Networking: The Convergence of the Internet and the Enterprise Mark Leary	**Web Talk 2000: Opportunities for IT Vendors, Threats to Telephone Companies** Mark Winther	**Wireless and Mobile Meet IP and Internet** Iain Gillott

4:15–5:00 CLOSING SESSION

- **Innovation in an Age of Creative Destruction** *Paul Saffo — Director and Roy Amara Fellow, Institute For The Future*

Search, Development Tools Hot Topics at Lotusphere

Companies offer products and services to help users and IT managers find information they need

BY LEE COPELAND

MESSAGING management and Web application tools will be in the spotlight at Lotus Development Corp.'s Lotusphere 2000 annual user conference in Orlando this week. But a search technology firm and an information provider will also make a bid for center stage.

CONFERENCE PREVIEW

Search technology vendor Sentius Corp. hopes to tackle the daunting user challenge of retrieving information from Notes/Domino databases, while TechTarget.com Inc. provides information targeted at information technology professionals working with specific IT platforms.

Lotusphere 2000 will mark the U.S. debut of Sentius, in Palo Alto, Calif. Sentius develops RichLink, a natural-language search technology for Notes/Domino databases. With the RichLink tools, document and content creators embed annotations or links within published online documents.

By using a custom set of search terms, users can find documents and relevant data more easily, the company said. Pricing starts at $2,000 per month and varies depending on language and database support.

TechTarget.com collects information and develops custom content relevant to IT professionals working with platforms such as Notes/Domino (*www.searchdomino.com*), IBM's AS/400 and Microsoft Corp.'s Windows NT.

The Dedham, Mass.-based company is expected to launch a portal focused on storage technology at the show.

Other announcements expected at Lotusphere include the following:

■ Tally Systems Corp. in Hanover, N.H., plans to release Veranda for Lotus Domino. The new e-mail management and reporting tool tracks errant messages and provides utilization data for individual mailboxes and servers. Pricing starts at $1,995 for 100 users and $5,495 for 1,000 users.

■ Stampede Technologies Inc. in Dayton, Ohio, plans to preview its TurboGold Advanced Server for IBM's AS/400 and RS/6000 platforms. The TurboGold product uses cache, compression and streaming technology to boost the replication performance of Lotus Notes databases. The product reduces loading times on internal networks and for remote users. Pricing starts at $6,295 per server.

■ BMC Software Inc. in Houston plans to release an update to its Patrol performance enhancement tool. Designed to increase availability and response times on Domino servers, Patrol measures access and task completion times.

■ IT Factory Inc. in Cambridge, Mass., will unveil a system for developing Notes/Domino applications called ITF eComponent Architecture. It will also announce an alliance with enterprise resource planning (ERP) vendor Lawson Software in Minneapolis. IT Factory hopes to provide better access to Lawson's ERP software via connectors that integrate with IT Factory's component software.

■ Ives Development Inc. in Beverly, Mass., plans to release TeamStudio Design System 13.0, an integrated suite of development tools for Notes and Domino. The set includes TeamStudio Analyzer for analyzing database application design, TeamStudio Configurator for finding and replacing text strings, TeamStudio Delta for comparing differences in design elements, TeamStudio Ciao for version control and TeamStudio Librarian for storing reusable design elements. Pricing starts at $495 per tool, or $2,855 for the suite. ◗

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BRIEFS

Microsoft Previews Tools To Link Unix, Windows

Microsoft Corp. is making Beta 2 of its Microsoft Services for Unix (SFU) 2.0 available for download. The software adds features to Windows NT and Windows 2000 that make it easier for information technology managers to use both Windows and Unix systems.

Among other features, components in the tool kit help customers integrate Windows systems into existing Unix environments. The components also simplify network administration and account management across both platforms, Microsoft said.

Microsoft expects to ship SFU in the second quarter. Beta 2 is available for download at *www.microsoft.com/windows/sfu.*

ShopNow.com Chooses Persistence App Server

Seattle-based ShopNow.com Inc. has selected San Mateo, Calif.-based Persistence Software Inc.'s PowerTier application server to support the payment-processing and fraud detection system for its Web site.

ShopNow.com Chief Technology Officer Ganapathy Krishnan said he expects that PowerTier's caching and replication will help with load balancing and fail-over, allowing his company to build a highly reliable system.

Incentive Upgrades Compensation Tool

Incentive Systems Inc. in Burlington, Mass., has released an upgrade of its compensation management software with a new library of templates that can be used to speed the development and modification of payment plans for bonuses and commissions.

The Incentive 2.0 upgrade also includes a revised user interface and improved Web-based reporting capabilities, the company said. Pricing starts at $750 for each employee whose incentive payments are being managed by the software.

www.incentivesystems.com

Sequoia Supports BizTalk

Sequoia Software Corp. in Columbia, Md., has announced that its XML Portal Server is compliant with Microsoft's BizTalk 1.0 specification. Sequoia makes software that helps companies build interactive enterprise information portals.

The BizTalk specification describes how businesses can share XML documents and other XML-tagged data. XML is a content-tagging language used for exchanging data.

www.sequoiasoftware.com

Global Finance September 1999

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As Director of the AMS Center for Advanced Technologies, Dr. Butler's mission is to increase our understanding of emerging technologies. "Ours is a commitment to keeping AMS clients on the frontier of IT practice," she says. "To address technologies that will fundamentally change the business landscape."

YOU CALL THIS WORK?

MONTHS BEFORE MOST OF US SEE THE LATEST TECHNOLOGY, DR. BUTLER GETS A PEEK AT THE REALLY INTERESTING STUFF.

For example, her team's initial XML research yielded an intelligent agent that collects relevant information across multiple sources then synthesizes, categorizes and disseminates it based on a user's specified interests. "Our Next Generation Enterprise and Business Intelligence & Knowledge Management labs are collaborating now to evaluate emerging non-numeric mining tools," she proudly reports. "We'll be releasing the results soon."

And where does Dr. Butler gain her understanding of emerging technologies? From her peers, at conferences, from the Web and from *Computerworld*. The Newspaper for IT Leaders.

COMPUTERWORLD
THE NEWSPAPER FOR IT LEADERS

X for Printers And Lookups, M for Mice

BY RUSSELL KAY

AMONG THE VARIETY of new computer-related products that pass through *Computerworld*'s technology group, many turn out to be quite useful but aren't important enough, in some respect, to warrant a full-blown review. Still, we think many readers would benefit from knowing about these products. That's the mission of this new page, called Hands On. We're taking the space that's been occupied by Exec Tech and repurposing it to deliver what we hope is greater value to you. Once a month or so, we'll run a full Exec Tech page to highlight specific categories of products, with greater emphasis on their importance to information technology managers than in the past.

Redefining Printers

In recent months, I've used two multifunction printers from Xerox Corp. that almost redefine that category. The XD-100 is a black-and-white laser printer married to a flatbed scanner, resulting in a laser printer that's also a personal copier. As a 600-dpi laser printer, it's worked flawlessly. Although rated at eight pages per minute, it's a tad slow delivering the first page. As a copier, the machine functions just like any normal office copier, offering reduction, enlargement and density adjustments. The copy controls look the way you'd expect them to, so using it is easy. At $500, the XD-100 offers versatility for just $100 more than an entry-level office-grade laser printer.

The second printer I've tried from Rochester, N.Y.-based Xerox is the Xi70c. This is a very different animal, based not on a laser but on a 1,200-dpi ink-jet printer engine made by Lexington, Ky.-based Lexmark International Inc. At a price of $300, it offers color printing and comes equipped with a flatbed color scanner/copier.

Both devices have an attractive, businesslike design that's at home in any office, and I had no problems when I used them. Neither offers a direct faxing capability, but the flatbed scanner/copier features make them much more useful than a typical multifunction printer's sheet-fed scanner. Also, as combination devices, they take up a lot less room than a separate printer and scanner would. Check them out at *www.xerox.com*.

THE INTELLIMOUSE Explorer features an optical design with no mouse ball

Mighty Mouses, Kinder Keyboards

Since *Computerworld*'s review of mice [Exec Tech, April 19], some interesting new units have arrived.

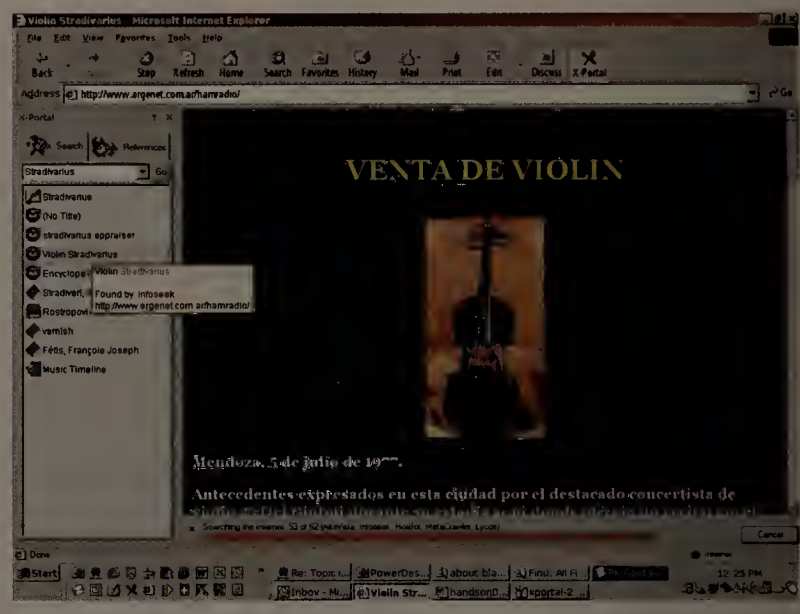
First, Microsoft Corp. unveiled two versions of its optical mouse (*www.microsoft.com/mouse/*). I'm currently using the bigger, sexier, silver, five-button IntelliMouse Explorer with my home computer, but despite the neat red glow spilling out the back and sides, I actually prefer the less-expensive, plain-white IntelliMouse with IntelliEye. Both claim to eliminate the need for mouse pads because they can operate on almost any surface, but in practice they still work better on a mouse pad than on a plastic-laminate desktop. Their optical design eliminates the need for cleaning the mouse ball (since there isn't one), but in my experience, that's never been a problem.

Another interesting mouse is Goldtouch Technologies Inc.'s Goldtouch Mouse. This unit's design is based on physiological research into the least-stressful hand position during mouse operation. (The company has a lawsuit pending against Microsoft for appropriating its proprietary data.) The Goldtouch is somewhat taller and bulkier than most other mice, but otherwise, it doesn't look out of the ordinary. In actual use, however, the $49.95 device is the most comfortable mouse I've tried, displacing my earlier favorite, the MouseMan from Fremont Calif.-based Logitech International SA.

An Australian company, Goldtouch (*www.goldtouch.com*) also makes an ergonomic keyboard that's split in half, with a ball-and-socket clamping joint that lets you angle the sides however you want, fore and aft as well as up and down. It's a clever design that will probably best serve those with unusual placement needs — but the company has moved some important keys, including delete, from their accustomed places. The keyboard is available for $129.95. Still, I find I slightly prefer both standard keyboards and those with Microsoft's "natural humpfront" design, like its new Pro model, which has an array of Internet and multimedia function keys.

THE XEROX XD-100 is a laser printer that's also a copier

Goldtouch rounds out its ergonomic package with a standalone numeric keypad and a very effective set of foam wrist supports and mouse pad. All in all, it's a good package: You can get everything for $219; much less than the cost of treating any repetitive-stress injury.



INTELLIGENT REFERENCE AND WEB-SEARCH capabilities are the strong points of X-Portal Findware from KCSL

Search No More

One software tool that's become standard on my computers is X-Portal Findware from Toronto-based KCSL Inc. (*www.kcsl.ca*). This lookup tool combines several useful reference works, including the complete *Columbia Encyclopedia*, some general and specialized dictionaries, an atlas, several almanacs and more, totaling more than 200MB of hard-disk space in all, with a multifaceted Web search engine.

When you type in a search term, X-Portal tells you what it already knows from its own suite of reference materials and then queries the Web using a number of search engines. X-Portal displays results in a continually updated stream of items and Web site addresses. You can examine any reference without interrupting the search. Unlike most search tools, this one looks at the Web references it finds, evaluates them in a proprietary way against the references it already knows about to assess quality and relevance and then sorts them all. Thus you're not presented with an endless, unfiltered list of Web sites to look through.

The $49.95 X-Portal integrates nicely into Internet Explorer 5, operating in the same way as its "search," "history," and "favorites" buttons. It doesn't work with Netscape Communicator yet.

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HOT TRENDS & TECHNOLOGIES IN BRIEF

TCP/IP

BY LEE COPELAND

DEFINITION

TCP/IP 4.0 helps networked computers and other devices communicate. Although many proprietary approaches for handling network communications have been introduced, by the early 1990s, TCP/IP emerged as the dominant model for linking nodes over the Internet.

AT THE MOST basic level, TCP/IP offers a set of rules for conversing among networks. The network protocol governs the complex web of Internet-based communications.

TCP/IP (Transmission Control Protocol/Internet Protocol) sets the communications standard for trillions of data packets. The protocol prescribes a well-specified set of procedures for these packets to follow as they zip from node to node.

"TCP/IP is a set of protocols that enables packets to be run across wires," explains Bruce Robertson, program director for Global Networking Strategies at Meta Group Inc. in Stamford, Conn.

The wire that connects each node — computer, modem or routing device — consists primarily of copper wire or fiber-optic cables. But as the demand for digital data transmission increases, so does the use of TCP/IP in other media, such as telephony and air- and radio-wave broadcasting.

Internet Connections

Originally designed by the U.S. Department of Defense, TCP/IP was widely used in information technology systems at universities and government agencies. But its commercial usage paled in comparison to competing approaches, like Novell Inc.'s SPX/IPX, Microsoft Corp.'s NetBEUI protocol suite or IBM's SNA. Until the Web, which also set TCP/IP as its protocol of choice, grew in popularity, a debate raged over which communications protocol would dominate network communications.

"Why did TCP/IP win the battle for the ubiquitous networking protocol?" says Raymond Keneipp, director of market research firm The Burton Group in Midvale, Utah. "The Internet ended the debate, because if you want to play on the Internet, you must use TCP/IP. The real power of the Internet is the fact that anybody can talk to anybody. Previously, it was a major project for company *A* to talk to company *B* [through networked computers]."

How TCP/IP Works

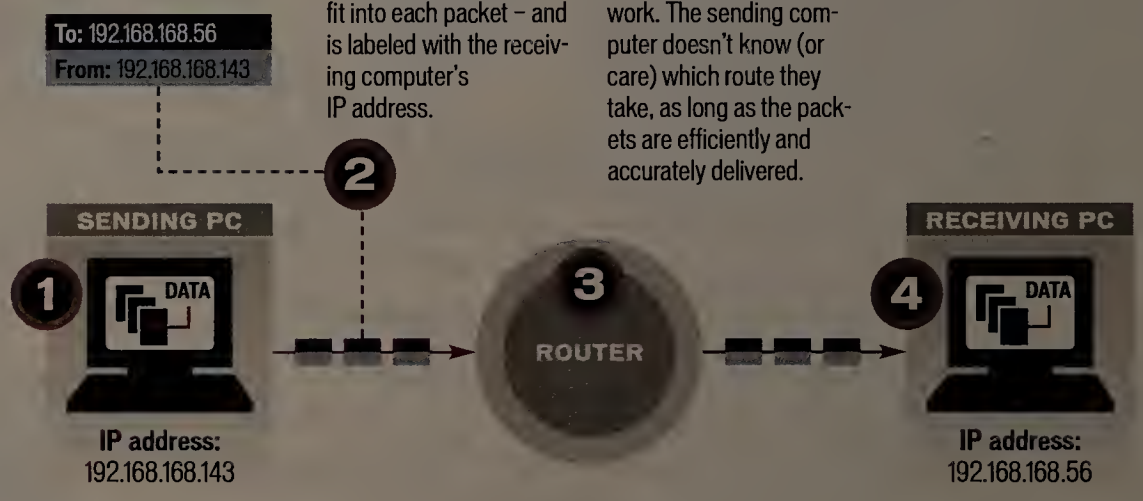
To understand how TCP/IP works on network data transmissions, it might help to think of a TCP/IP network as the Postal Service. You and your correspondents would play the role of TCP, the envelope you use would correspond to the IP part of the protocol and your mailing addresses would be the sending/receiving computers.

1 Each computer (or other device) attached to the network has a unique physical address, called its IP address, that takes the form xxx.xxx.xxx.xxx when xxx is between 0 and 255.

2 TCP breaks the data into manageable chunks that can be shipped easily and efficiently. IP, the "envelope," contains the data – its size determines the amount of data that can fit into each packet – and is labeled with the receiving computer's IP address.

3 The IP packets are sent across the network, where a routing device reads the destination IP address and forwards the packets along the fastest-available route on the network. The sending computer doesn't know (or care) which route they take, as long as the packets are efficiently and accurately delivered.

4 On the receiving computer, TCP checks to make sure all the data packets have been received and reassembles them into readable form.



Alternative Transportation

While TCP/IP has emerged as the cornerstone of Internet transport in the past few years, alternative networking communication frameworks have moved to the sidelines.

By the fall of 1998, Novell ended its reliance on SPX/IPX and reworked its NetWare 5.0 software to natively support TCP/IP. Novell officials said customers overwhelmingly demanded an open system based on TCP/IP. Microsoft added TCP/IP support to its software sooner, even though NetBEUI continues to exist in Windows and runs over TCP/IP.

"That's the ugly secret inside Windows today," says Tim Sloane, managing director for Internet infrastructure research at Aberdeen Group Inc. in Boston. NetBEUI "is the original DOS communications protocol, and it creates lots of network confusion and traffic in mixed-node networks."

IBM introduced SNA in 1974 to support network routing communications in mainframe computing environments. But it has long since adopted TCP/IP support. "Of all the protocols, the one that people want is TCP/IP," says Bill Reedy, vice president of marketing for business integration at IBM. "Even where SNA has a big advantage in terms of reliability and even performance, the customers are standardizing their network to intermix devices, voice and data. TCP/IP is the way we communicate over the Internet."

"This is a done deal; there's not a question about this anymore," adds Robertson. "In the last five years, it's become clear TCP/IP is *the* protocol. And in the last two years, the Internet completely anointed it."

Even so, TCP/IP doesn't provide the best fit for every network. Because not all networks transmit their packets of data at consistent speeds or within well-defined WAN and LAN perimeters with standard bandwidth, in many cases TCP/IP proves too cumbersome to use.

For example, many wireless networks utilize lower-level protocols such as the Wireless Application Protocol and Cellular Digital Packet Data to handle digital data transmission on handheld devices. A roaming cellular phone user requires a more resilient protocol to accommodate fluctuations in bandwidth and network availability. Other devices, such as communications satellites, also present challenges.

"It is admittedly not perfect for every possible network environment, but it's so good at most of them that it becomes a very simple way for applications to use most networks," Robertson says. "Even if it's not the most efficient, it's the most practical."

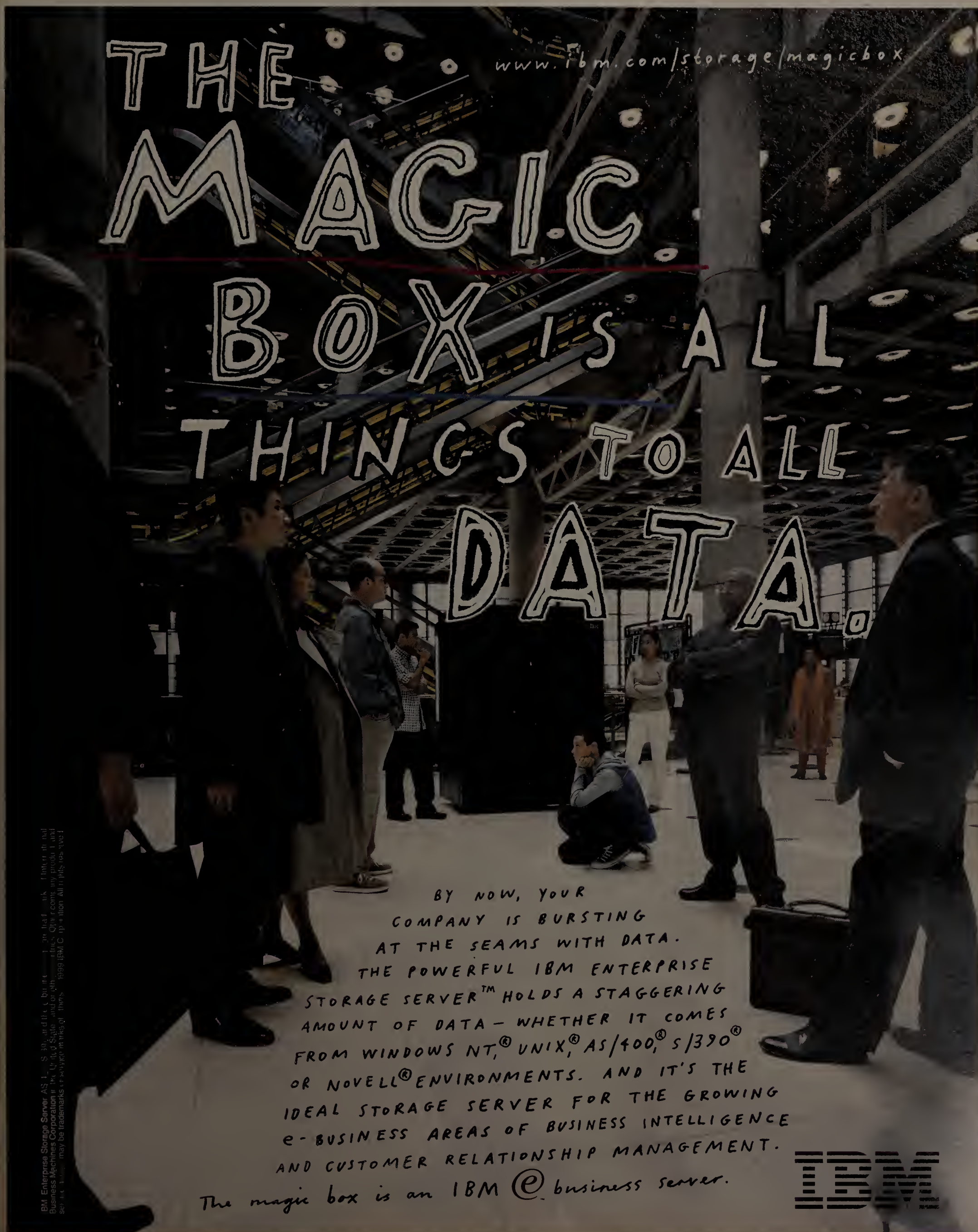
Evolving Protocols

As networks and their data traffic evolve, so do the protocols designed to support them. Working groups at the Internet Engineering Task Force continue to augment the communications stack with new, complementary protocols like Dynamic Host Configuration Protocol (DHCP), which automatically assigns IP addresses to client stations as they log on to a TCP/IP network. Without DHCP, IT administrators must manually assign IP addresses to network devices.

The upcoming version of TCP/IP will also support expanded Internet addressing. "One of the problems with TCP/IP today is that it does not have enough address space," Keneipp says. "Every single network device has its own address, and this means millions of addresses."

Keneipp says TCP/IP Version 6 expands today's four-group format to six (from xxx.xxx.xxx.xxx to xxx.xxx.xxx.xxx.xxx.xxx) to handle the growing number of handheld and embedded devices that require their own Internet addresses.

Are there technologies or issues you would like to learn about in QuickStudy? Please send your ideas to quickstudy@computerworld.com.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Active Directory: For Now, Try to Live Without It

Active Directory — Microsoft's answer to NDS, LDAP and just about every other method of classifying users and resources — hits the streets next month with Windows 2000. *Computerworld*'s Cynthia Morgan asked Win 2K expert **John Enck** at Gartner Group Inc. for his advice on when (or whether) IT organizations should plan to adopt this most complex of directory services.

After years of promises, we're finally going to see the release of Microsoft Corp.'s Active Directory. Do you think it will live up to the company's claims? Clearly, the scope of the product has changed. Originally, Microsoft intended it to be more of a metadirectory than it is today. It was going to be the all-encompassing global enterprise directory service that worked across platforms. That's a far cry from what we'll see in Windows 2000.

We're recommending that clients try to live without Active Directory in the short term. There are certainly interesting and useful things you can do with Windows 2000 without migrating your whole environment to Active Directory.

Network directories are still going to happen, but Microsoft may not be the market dominator they wanted to be. That's in part because Novell has done such a good job in getting its own service, NDS [Novell Directory Services], out there. And Active Directory has clearly been held back by the fact that it hasn't been available.

What happened to change Microsoft's plans for Active Directory? Microsoft was simply too operating system-centric in its plans, and that's hurt. Microsoft simply didn't take a good enough look at what network directory needs really were. For example, Active Directory isn't the greatest solution for, say, Internet appliances and other devices. It's too large and too complex to fit that model.

So whose directory service will dominate in large information technology organizations? It's far too soon to call. Directory domination isn't a done deal by any means. Plenty of people have adopted NDS eagerly and it's available on so many other systems, but people aren't really running it unless they have NetWare somewhere. And Active Directory has the same problems as NDS when it comes to anything outside the conventional network space. It still hasn't been tuned well for an Internet appliance. Actually, no directory has managed that.

Microsoft has made a tacit admission that Active Directory isn't all they wanted it to be and that it won't dominate the enterprise in the near future. That was the compelling reason behind the ZoomIt/Via acquisition. [Microsoft acquired Toronto-based ZoomIt Corp., a developer of metadirectory services, last July]. The ZoomIt/Via product acts as a kind of master directory for multidirectory environments. Its Via metadirectory service will ship as part of the Windows 2000 releases next month.

So should large organizations move to Windows 2000? Consider Windows 2000 on an application-by-application basis and assume you'll be running in mixed mode. There's no reason you can't have Windows 2000 laptops if that makes sense for your business. Gartner does not, under most circumstances, recommend a wholesale migration to Windows 2000.

Of course, you can play all sorts of what-if games with that. If someone doesn't have any desktop management capabilities at all, and that's hurting them, then Windows 2000 could be a cost-effective way to gain that capability.

IT managers have complained that Windows 2000 and Active Directory are posing huge training problems for technology personnel. Why? Active Directory is much more difficult to learn because it does so much more than the simple authentication performed by NT's trusted domain system. The complexity is far beyond NT 4, or even Novell's NDS.

But the learning curve you're talking about isn't because Microsoft did anything wrong, although I suppose one could argue that they're throwing too much new stuff into a single product. The problem is that what's in Active Directory is where directory services have needed to go anyway. Novell's NDS was a big learning curve for NT administrators for the same reason. And frankly, NDS administrators are going to have a bumpy road bringing their staff up to speed on Active Directory because it does that much more.

The biggest negative to Active Directory is that it is so OS-centric. It's so very tied into Windows that it would be extremely difficult to use it with any other environment. That makes it a boon to developers, who only cope with a single set of requirements, but it's tough on the mixed networks the rest of the world needs. That's very, very much Microsoft protecting its own turf, as it's always done.

> People don't realize that they're going to have problems running applications under Windows 2000.
>
> JOHN ENCK, GARTNER GROUP INC.

When Microsoft first announced Active Directory, it also promised to work to port Active Directory to the most popular flavors of Unix. That's gone by the wayside. Is that also Microsoft protecting its turf? [Laughs.] It's more a case of everyone else protecting their own turf, I think. I can't imagine any Unix vendor enthusiastically adopting Active Directory. Can you?

But seriously, that's why synchronization across directories and metadirectories gets more interesting and becomes so important. Everyone should understand that we'll be living with multiple directory services on the network for some time to come.

Are you working in a Windows 2000 environment? I personally moved my home-use laptop over to Windows 2000, and there were some surprises, especially with application compatibility. Many people don't realize that they're going to have problems running applications under Windows 2000. Gartner's estimated that about 10% to 15% of applications will prove incompatible, especially with Windows 95 and 98 software.

Windows 2000 is a fine operating system if you're planning to buy all new applications. Maybe that's a bit harsh, but if you want all of the cool features Windows 2000 can offer, count on refreshing your applications. That's not welcome news if you're an administrator supporting thousands of users and all kinds of applications.

But what about Microsoft's contention that to gain stability in your operating system, you must be disciplined about the applications you run? In the long term, that's an excellent idea. In the short term, I'd much rather do technology refresh at my leisure. ◗

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Get the Right Answer, RightNow

Start-up RightNow automates rapid, accurate customer response system

BY AMY HELEN JOHNSON

OH, THE CURSE of enthusiastic customers. If you can't respond to them right away, they quickly become angry customers. RightNow Web might be one way to keep them enthusiastic. It's a tool that automates building and maintaining an online knowledge base where customers can find the answers to their questions.

Start-up RightNow Technologies Inc. produces the software, and first indications are that the Bozeman, Mont.-based company may be on to a good thing.

At Specialized Bicycles Components Inc., a Morgan Hill, Calif., manufacturer of off-road and racing bikes and accessories, the curse of enthusiastic customers appeared in the form of dozens of e-mails per day from people asking for product specifications, dealer locations, troubleshooting tips, warranty details and so forth. Now, before you say, "My company should be so lucky to have such problems," consider this: Specialized didn't have the personnel to answer the inquiries, and it paid a price.

"It made people mad at us that we didn't answer," says Mike Regan, the company's senior manager for global electronic marketing. After a little digging, he found out that his customers were heavily wired: About 80% had Web access. So he married their enthusiasm for their bikes and their enthusiasm for the Web and purchased RightNow Web.

Specialized's situation is a familiar story to Greg Gianforte, CEO of RightNow. "In most cases, e-mail is a black hole," says Gianforte. "If someone has to send e-mail, the Web site has failed at that point."

RightNow's flagship product, RightNow Web, works by expanding the knowledge base on a company's Web site as questions come in and answers go out. A few questions and answers seed the knowledge base in the beginning, but they won't cover the whole range of possible inquiries, so customers will continue to send information requests. A technician or customer-service person answers the e-mail and posts the question and answer to the knowledge base so the next person can find the answer on the company Web site. Essentially, says Gianforte, the customers themselves write the knowledge base.

This approach allows RightNow clients to get a list of frequently asked questions up and running quickly. In Specialized's case, *quickly* meant four hours. "We didn't have many questions to start," says Regan, but the company "added five to 10 questions a day."

RightNow Web also has a statistical component that allows users to measure a question's popularity. Frequently accessed questions rise in the hierarchy and get presented sooner, hopefully giving customers the answer sooner. It's a great feature from the standpoint of efficient customer service, says Regan, but he also found a way to use it for market research. He posts a Q&A list about an issue — say, what's better: supergloss color or anodized finish? — in order to gauge customer interest. If no one reads the Q&A, then there's a good chance that customers don't care.

GREG GIANFORTE: Forcing customers to send queries via e-mail is "like having the phone ringing and no one's answering"

RightNow Technologies Inc.

COMPUTERWORLD emerging companies

Location: 601 Haggerty Drive Bozeman, Mont. 59715

Telephone: (888) 322-3566

Web: *www.rightnowtech.com*

The technology: Self-service customer support on the Web

Growth potential: Aberdeen Group Inc. forecasts a 33% compound annual growth rate through 2002 for customer care.

Why it's worth watching: Little maintenance needed; knowledge base grows as customers use it.

Company officers:
- Greg Gianforte, founder and CEO
- Jeff Honeycomb, president and chief operating officer

Milestones:
- Third quarter 1997: Founded
- First quarter 1998: RightNow Web shipped
- December 1999: RightNow E-mail launched
- January 2000: First round of venture-capital financing

Employees: 90, doubling yearly

Profitability date: Achieved profitability in first quarter of 1998

Burn money: Gianforte himself invested the initial $50,000 for start-up. Remainder of financing came from a $16.2 million venture capital funding round this month.

Products: RightNow Web, RightNow E-mail, RightNow Live

Customers: More than 400, including Ben & Jerry's Homemade Holdings Inc., Sprint Corp. and Xerox Corp.

Partners: Oracle Corp., Intel Corp., VA Linux Systems Inc. and Red Hat Inc.

Red flags for IT:
- Traditional customer relationship management systems vendors such as Siebel Systems, Vantive Corp. and Pivotal are moving in.
- Runaway growth train may derail.
- Customers will soon demand more sophisticated customer-support tools for the Web, so RightNow products will have to mature.

A Growing Market

RightNow has expanded its product line with RightNow E-mail, an automated e-mail management engine, and RightNow Live, which adds an online chat component to Web support. It's part of Gianforte's plan to stake a claim in the nascent electronic customer relationship management market.

Those are steps in the right direction, says Chris Selland, an analyst at The Yankee Group in Boston. RightNow has a good entry-level product, he says. It doesn't have a lot of bells and whistles, but it's sufficient for about 80% of the company's potential customers. "They're a good choice if you're looking to get some support capabilities on the Web and get them up there quickly," says Selland, explaining that RightNow's products have a low cost of entry that has made them attractive to a large number of companies.

But RightNow needs to grow in order to maintain its momentum, says Selland. In the future, it will have to provide both inbound and outbound e-mail management — a direction that Gianforte says he agrees with. And RightNow Live has to evolve from a chat-based format to a telephone model, Selland says.

"They're a big success story so far," says Selland, "but the road gets harder from here." ◗

Based in Seattle, Johnson is a contributing writer for Computerworld.

[the buzz]
STATE OF THE MARKET

The Future of RightNow

A customer who chooses to interact with a company over the Web wants service and support tools to be available on the Internet. This demand has brought into RightNow's niche many of the players in the traditional customer relationship management (CRM) market who sell to large and midsize corporations with growing Web-oriented customer bases.

The Yankee Group analyst Chris Selland says these vendors, including Siebel Systems Inc. in San Mateo, Calif., and Pivotal Corp. in North Vancouver, British Columbia, aren't direct competitors yet. If they do take a run at RightNow's niche, they're just as likely to buy as build. That could be good news for RightNow if it's willing to consider an offer.

Although upmarket companies aren't trying to gobble RightNow's customers, some CRM vendors such as Silknet Software Inc. in Manchester, N.H., are already in the electronic customer self-service business. But fellow start-ups are probably the biggest threat. Like RightNow, they have to grow to survive, and that means new markets.

Kana Communications Inc.

Palo Alto, Calif.
www.kana.com

Kana systems help service representatives answer e-mail efficiently – a slightly different niche than the one RightNow occupies. RightNow's goal is to eliminate e-mail by supplying answers with frequently asked questions lists. But Kana's a close enough cousin that Selland isn't surprised to see it considering RightNow's market. With an initial public offering last year that supplied a few hundred million dollars, Kana could give RightNow some grief.

AskJeeves Inc.

Emeryville, Calif.
www.ask.com

Like RightNow, AskJeeves provides a knowledge base that users can query online. The portal site – which is a general database managed by an editorial team – is the best-known piece of the company. But AskJeeves also makes a lot of money by licensing its software, says Selland, pointing out that Round Rock, Texas-based Dell Computer Corp.'s AskDudley is a relative of AskJeeves. In November, AskJeeves purchased Net Effect Systems Inc., gaining live chat technology that competes with RightNow Live.

– Amy Helen Johnson

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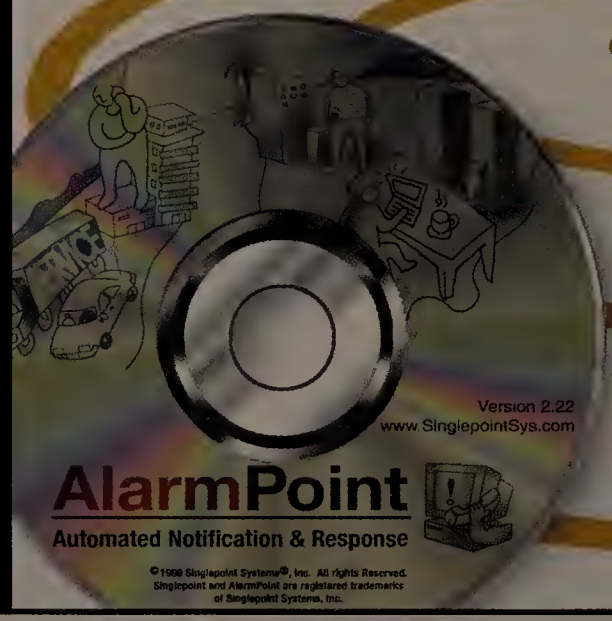

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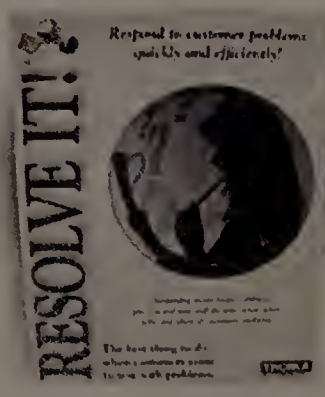

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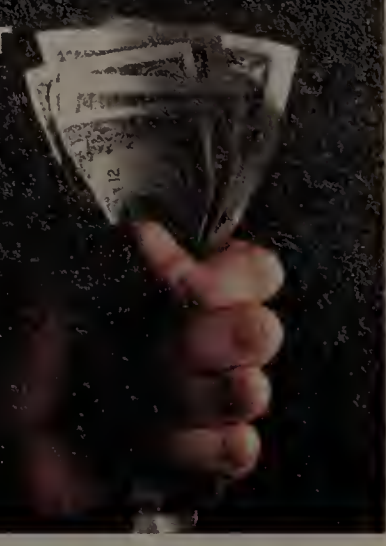

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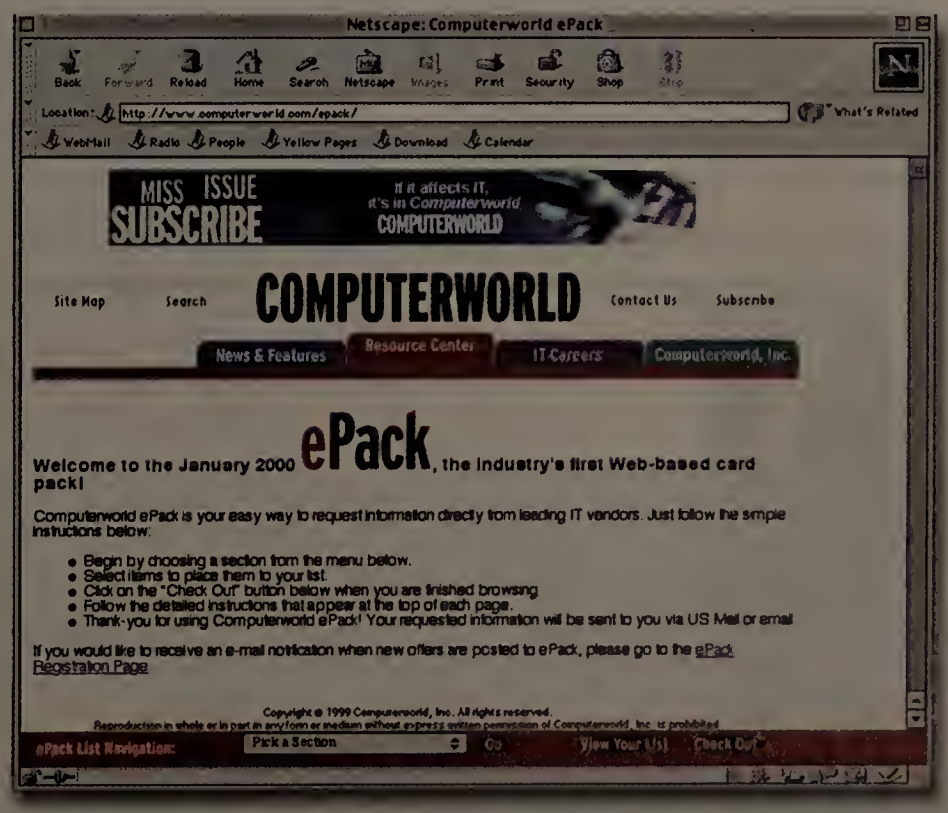

The Silicon Sandbar

BY ERIK SHERMAN

CAPE COD, MASS., a flexed arm of a landmass jutting into the Atlantic 60 miles south of Boston, is having a virtual economic renaissance.

Tourism and fishing still reign, but they've been joined by a wave of entrepreneurs trading blue suits for boat shoes, creating a new nickname for the area: the Silicon Sandbar. All this means opportunities for IT professionals who long for a more relaxed pace of life.

To make the jump, though, plan to be flexible on just what an information technology job is.

The high-tech trend on the Cape started nearly 20 years ago, when entrepreneurs like Bob Pemberton, CEO of Infinium Software Inc. in Hyannis, Mass., decided to work where they lived, not live where they worked.

"At one point in time in economic history, you could only form companies in certain places," says Pemberton. "Today, it's very easy to do."

Today, the Cape Cod Technology Council has 360 members. Three-quarters of them are either high-tech research and development companies or businesses that rely on IT, such as hospitals, banks and radio stations.

Some of the companies have seen impressive growth. Infinium has more than 600 employees worldwide and annual revenue of $120 million. Lucent Technologies Inc. in Murray Hill, N.J., recently bought Cape-based Excel Switching Corp. for $1.7 billion. A start-up like Taqua Systems Inc. in Hyannis can receive tens of millions of dollars in investment money.

All this translates into job opportunities. Still, Cape Cod is neither Route 128 (Boston's "Technology Highway") nor Silicon Valley, with densely packed companies. If things don't work out well with one employer, you won't necessarily find your next job across the street.

Employers are also small to medium-size, with no enormous IT departments. To work on Cape Cod, plan on flexibility and consider career shifts, like moving into product development.

"There's not enough people to go around," says Matt Trask, president of Communica Inc., a contract development house in Bourne, Mass. "We're always looking to hire people with the right mix of skills and experience." That mix for many employers can include development and even project management skills. Experience in a vertical industry or an application-specific area can also be attractive.

Salaries on Cape Cod may have lagged behind other areas in the past, but those days are gone. "Just to get people, you're paying everything they get in Boston," says Dave Michaud, CEO of Taqua, which pays $80,000 to $120,000 for software engineers with 10 years of experience.

Lifestyle Matters

Pemberton warns that shifting career paths can also mean changing attitudes. There's the need to embrace the Cape Cod way of life, where "quality of life" becomes a key issue that may need other adjustments. Those coming from a city environment will find the pace of life slow in comparison.

"When we transfer someone from Texas to anywhere here," says Pemberton, "their reaction is 'God, look at the houses! The rooms are so small!' "

Choosing the right house takes some research. Cape Cod is a big retirement area, with many neighborhoods devoid of young children, making them unattractive to young families.

Prices on the low end are similar to suburbs of Boston but can rise to astronomical levels.

Those who want more choices in housing can commute to the Cape. Some employers claim to have employees living as far away as Boston and Providence, R.I. Luckily, the drive goes against traffic, even in tourist season, when highways are jammed with bumper-to-bumper traffic as people look to get away for the weekend.

The Cape is struggling with some issues. An exploding population, especially during the summer tourist season, has caused concerns about fresh water supplies. And building is restricted to two stories, making it more difficult for firms to grow.

Public schools are also a concern to many because of undistinguished average student performance on statewide achievement tests and a perceived lack of educational emphasis on preparation for technology. Yet Pemberton stresses that such issues shouldn't put blinders on your eyes. "Those are more tactical issues," he says. "We don't have strategic problems."

Sherman is a freelance writer in Marshfield, Mass.

> "Just to get people, you're paying everything they get in Boston."
>
> DAVE MICHAUD, CEO, TAQUA SYSTEMS

Bay State Hiring Insanity

Hiring managers in Cape Cod, which is considered part of the eastern Massachusetts job market, which includes Boston and the Route 128 technology corridor, are in good company when it comes to hiring plans this year, according to Computerworld's Annual Hiring Forecast, published this month. Reported hiring plans for IT professionals make Massachusetts the second most aggressive state for IT recruiting, behind Washington. Consider the following hiring projections for the region:

(Note: The 12-month projections include the 3-month figures.)	3-MONTH STAFF CHANGE THIS YEAR	12-MONTH STAFF CHANGE THIS YEAR
Permanent staff members	+6%	+30%
Temporary staff/ contractors	+32%	+21%

SOURCE: *COMPUTERWORLD*'S ANNUAL HIRING FORECAST, JAN. 3, 2000

Top Skills in the Silicon Sandbar

IT managers in the Cape Cod region report they will be hiring most for the following technologies this year:

TECHNOLOGY AREA	TOP SKILLS NEEDED
Internet development	Java, HTML, ActiveX
Languages	C++
Development tools	Visual C++, Visual Basic
Networking	TCP/IP

SOURCE: *COMPUTERWORLD*'S ANNUAL SKILLS SURVEY, NOVEMBER 1999

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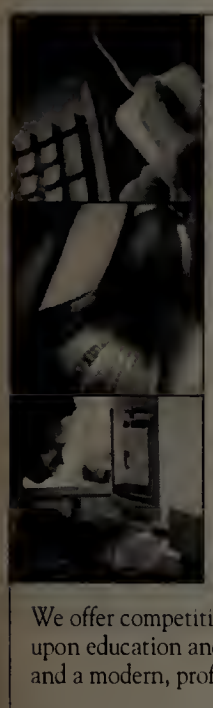

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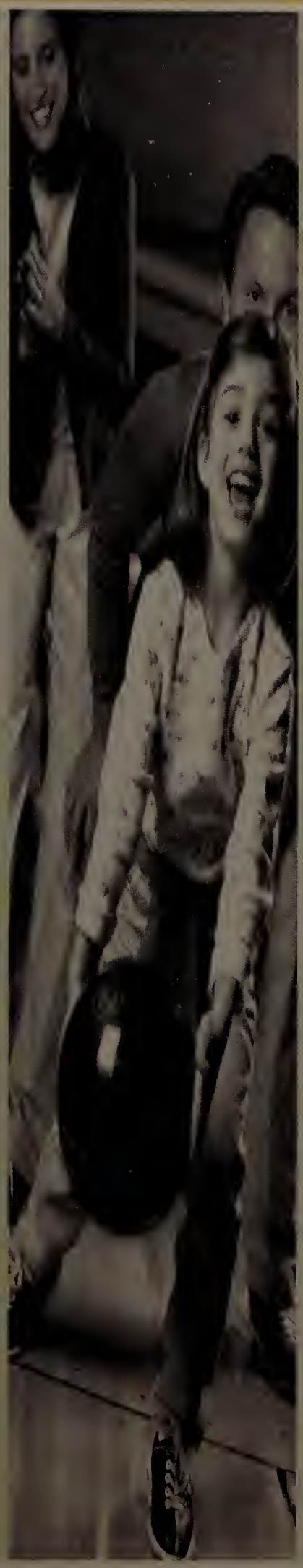

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Openings in Pittsburgh, PA and Detroit, MI. Requires a Master's degree in Computer Science or Information Systems and one year of experience in job offered or one year of experience with the implementation of Oracle manufacturing and financial applications. Experience must include use of Oracle database administration tools and the use of HP UX, Windows, and PCs. Must have obtained certification as an Oracle Master Database Administrator. Must be willing to be on call 24 hours per day, 7 days per week, and work various schedules overtime as needed. Manage the design, installation and implementation of Oracle manufacturing and financial applications, and the development of user applications using Oracle database applications tools. 40 hrs./wk. plus weekends and on-call as needed. Send resume to: Donald Keeler, Dana Corporation, P.O. Box 4097, Kalamazoo, Michigan 49003.

Sr. Software Eng., analyze, design & implement distributed database & communications service systems. Required: Master's or foreign deg. equiv. Computer Sc., Eng. or Math with 3 yrs work exp. in computer science, including 2 yrs object-oriented development, database programming & distributed computing (CORBA, RPC & TCP/IP).

Sr. Network Eng. II, design, install, & maintain all network equip. Required: Bachelor's or foreign deg. equiv. in Computer Sc., Computer Eng. or Elec. Eng. with 2 yrs exp. as Network Eng. for ISP including 2 yrs of TCP/IP and communications & routing protocols.

Software Developer, analyze, design & implement web-based applications for large subscriber base of internet service provider. Required: Bachelor's or foreign deg. equiv. in Computer Sc., Elec. Eng. or Math with 2 yrs exp. software development or system/network administration, including 2 years C, PERL, TCP/IP networking, DHCP, JAVA, Active X & UNIX administration.

System Analyst, modify & maintain major internet server programs (HTTP, HTTPS, FTP & SMTP) and systems. Required: Bachelor's or foreign deg. equiv. in Computer Sc., 6 mos. exp. in UNIX administration, system & network security, TCP/IP networking and C and PERL languages.

Respond to: Ms. Laurie Gardner
MindSpring Enterprises, Inc.
1430 W. Peachtree St., N.W. # 400
Atlanta, Georgia 30309

Applications/System Architects: Positions available in our New York, Chicago and San Francisco area offices. Will work with exceptional teams of computer and business professionals participating in full life-cycle development of distributed, object-oriented applications. Will design, develop and implement enterprise wide, distributed applications in various OO, client/server, n-tier environments against various relational databases. Will utilize OO languages, including Forte and Java and relational databases such as Informix, Oracle, Sybase, MS SQL Server, and DB2. Will lead development teams. Requirements: Bachelor's degree in Computer Science, Computer Engineering or Electrical Engineering or equivalent, plus five years of experience, which must include experience in programming with an object-oriented programming language; or Master of Science degree in Computer Science, Computer Engineering or Electrical Engineering, or equivalent. If interested, please email your resume and cover letter to jobs@thoughtworks.com.

Business Analysts: Positions available in our New York, Chicago and San Francisco area offices. Will work with exceptional teams of computer and business professionals participating in full life-cycle development of distributed, object-oriented applications. Will apply OO analysis and design methodologies and object modeling techniques to design OO applications. Will be responsible for working with users to define system requirements. Will translate those requirements into clear and precise specifications for the developers to implements. Will design screens, write use cases, design and perform system testing. Requirements: Bachelor's degree in Business, Finance, Computer Information Systems or related field, or foreign equivalent. 2-3 years of business/ systems analysis experience preferred, which should include software selection, design and/or development, implementation and/or conversion experience. If interested, please email your resume and cover letter to jobs@thoughtworks.com.

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Entergy, one of America's largest utility companies, has multiple openings for following occupations:

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For immediate consideration, please forward your resume with salary requirements to: Entergy Corporation; Attn: Ms. Gail Elgiar, HR Department, P.O. Box 61000, New Orleans, LA 70161 EOE/M/F/DN Principals Only. You will only be contacted if you are considered for an interview.

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Develop computer programs for financial applications. Work with Oracle Financials,SQL* Loader, Oracle Import/Export, Oracle 7.x/8.x, Oracle *Forms, Oracle*Reports, Designer 2000, Developer 2000, Unix, windows NT, Shell Scripting, and PRO*C. Req. B.S. in Computer Science/ Engineering, or other science/engineering discipline plus 2 yrs exp. in job offered. Resume to: HR manager, Software Services & Resources, Inc., 7204 Santafe Pkwy, Atlanta, GA 30350.

Programmer Analyst

responsible for analysis, design, development, testing, debugging and deployment of telemarketing applications on SOL Server and ORACLE 7.0 platform using ORACLE Forms, PL/SOL, SQR, SOL.
Design and implement fulfillment processes and modules for all projects. Interact with clients to understand business rules and develop functional specifications. Implement productivity, analysis and tracking for production support. 40 hour week, 9 AM - 5 PM, $58,000 per year. B.S. or Foreign degree equivalent. 2 years experience in job offered. Submit resume to: Dept. of Labor/Bureau of Workforce Program Support, P.O. Box 10869, Tallahassee, FL 32302, JOFL2030434

Business Analysts: Positions available in our New York, Chicago and San Francisco area offices. Will work as team leaders with exceptional teams of computer and business professionals participating in full lifecycle development of distributed, object-oriented applications. Will apply OO analysis and design methodologies and object modeling techniques to design OO applications. Will be responsible for working with users to define system requirements. Will translate those requirements into clear and precise specifications for the developers to implements. Will design screens, write use cases, design and perform system testing. Requirements: Master's degree in Business, Computer Information Systems or related field, or equivalent. If interested, please email your resume and cover letter to jobs@thoughtworks.com.

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Logica, Inc., is looking for entry-level and experienced candidates to fill the following positions, open at all of our US locations:

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PRODUCT DEVELOPMENT PROGRAMMER/ Yorkville, IL to: apply math. statistics and finance knowledge & programming logic to improve software design & develop program enhancements in response to the needs of customers. Apply math, statistics & finance knowledge as well as modeling & simulations experience to design, encode, test & debug subroutines of complex financial instruments such as bonds & derivatives. Consult with clients when appropriate regarding program features. Ability to program in Pascal. BS req'd in Computers/ Engineering plus University level coursework in finance or one year's experience working in a finance related field. Must have proof of legal authority to work permanently in US. 9 am - 5 pm, 40 hrs per wk, $40,800 yr. No OT pay. Send resume to: ILLINOIS DEPT. OF EMPLOYMENT SECURITY, 401 S. State St. 7 North, Chicago, IL 60605 Attn: Leila Jackson Reference # V-IL-20614J. AN EMPLOYER PAID AD, NO CALLS -SEND TWO COPIES OF BOTH RESUME & COVER LETTER

SYSTEMS ANALYST: Analyze, design, develop, modify, test & implement business software applications in the following operating systems and languages: Windows 95, Oracle, dBase, & C++. Evaluate user requirement for transfer of monies to Poland & existing software programming codes; determine program intent, data input & output requirements. Conceptualize & design or modify software application programs in accordance with client needs. Determine feasibility, cost efficiency, time required to complete each stage of the project. Plan development process including flow charts, systems specifications & outline steps. Prepare written documentation for new or modified software applications. Identify & resolve system operating problems in order to continuously improve the users business operations. Requirements: Master's degree in Computer Science & 0 years experience in job offered. Must read, write & speak Polish. 40hrs/wk; 9:00am-5:00pm; $56,553.12/yr.; Chicago, IL. Must have proof of legal authority to work permanently in the U.S. No calls. Send 2 copies of both resume & cover letter to IDES 401 S. State St.-7N, Chicago, IL 60605, Attn: Lydia Clarke. Reference # V-IL 21881-E. An employer paid ad.

Software Developers: Positions available in our New York, Chicago and San Francisco area offices. Will work with exceptional teams of computer and business professionals participating in full life-cycle development of distributed, object-oriented applications. Will design, develop and implement enterprise wide, distributed applications in various OO, client/server, n-tier environments against various relational databases. Will utilize OO languages, including Forte and Java and relational databases such as Informix, Oracle, Sybase, MS SOL Server, and DB2. Requirements: Bachelor's degree in Computer Science, Computer Engineering or Electrical Engineering or foreign equivalent, plus tive years of experience which must include programming in an object-oriented programming language; or Master's degree in Computer Science, Computer Engineering, Electrical engineering, or equivalent. If interested, please email your resume and cover letter to jobs@thoughtworks.com.

P.C. Applications Developer. 40 hrs./wk.; 8-5 p.m.. $51,574/yr. Develops, tests, documents, & implements Windows-based & mainframe/midrange-based program code within systems designed to present financial information to employer's financial, administrative, & marketing areas. Conducts internet/intranet application development. Performs problem analysis & resolution of employer's information systems to ensure that data is accurate & effectively supports employer's financial, administrative, & marketing areas. Formulates design specifications to develop information-based solutions to ensure effective outcomes. Tests. documents, implements, & supports program code & utilities to support employer's information needs. Communicates w/users & vendor support staff regarding status of development & support activities to ensure most efficient & effective solutions. Requires a masters in comp. sci., MIS, or management technology; 2 years' exp. in business functions such as accounting, finance, marketing, or securities trading; 1.5 years' exp. in: system design/development on mainframe or midrange & PC/LAN computing environments; design & development of business applications w/COBOL & DB2 mainframe/midrange; Visual Basic; Access; SOL; business application development; & internet/intranet web application development using HTML, SOL, Visual InterDev, Visual Basic or JAVA, VBScript, ASP, & NT IIS; & knowledge & proficiency in C++. ***Must have proof of legal authority to work in the United States. Send resumes to Iowa Workforce Center, 215 Keo Way, Des Moines, Iowa 50309. Refer to Job Order IA 1101006. This advertisement is paid by the employer.***

Senior Programmer/ Analyst

Provide and manage information system services and projects for assigned clients, internal services and projects, and benifits database and operations. Duties include conversion of System/36 data filed to AS/400 data files, create news programs in RPG III & IV, 40 hour work week; 7:30 am to 3:30 pm. Salary meets local prevailing wage standards. Requires Bachelor degree in Comp. Sci, Math or Statistics and 6 mos experience in job offered or 6 months experience as Programmer, Progrmr/Anal, Sys. Anal. or Applications Anal.. Education or experience to include use of AS/400, System/36, and either RPG III or RPG IV. In lieu of actual degree will accept evaluation of education, training &/or experience which establishes equivalency to degree, it issued by individual or company which is normally engaged in the business of providing credential evaluations. Must present proof of legal authority to work permanently in the U.S. Send resumes to Betty Novitski, Benefit Systems & Services, Inc., 760 Pasquinelli Dr., Suite 320, Westmont, IL 60559-5555.

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SENIOR STAFF
TECHNICAL SUPPORT
Production support, design, develop order entry, PKMS processes, receivables, inventory, EDI Process, invoicing for Customer, convert Legacy orders for all manufacturing organizations during ERP implementation. Convert on-hand quantities, stock locators for Oracle purchasing rollout.

The successful candidates will hold at least a Bachelor's or Master's degree in a relevant computer, engineering or physical science field with professional experience, where required, depending on the grade level of the position.

Resumes must reference location of interest and include salary history. For consideration please submit resumes to: Lockheed Martin/IBS, Attn: Human Resources/MP71, 681 Loop Road North, Kannapolis. NC 28081; Fax: 704-939-4275; E-mail: melissa.l.bitzer@lmco.com
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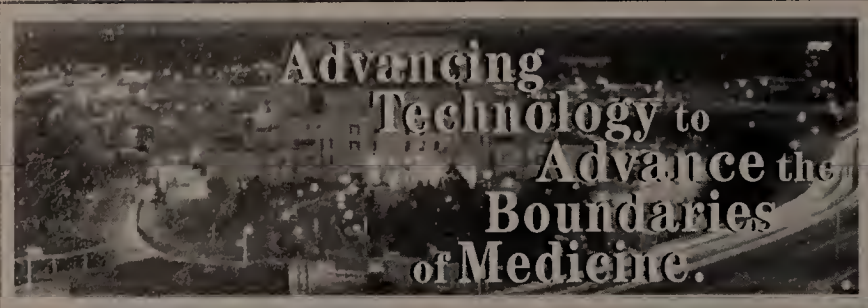
Senior Systems Engineer-Technical Lead

Provide conceptual & technical software solutions to complex business or technical telecommunications problems involving TCP/IP & X.25 communication protocols. Develop & implement standards & verify results. Provide technical expertise in client/server technology, telecommunications programming & graphical user interface (GUI) design. Perform independent evaluations & make recommendations on the use of hardware, software & networks. Instruct & supervise team of technicians to ensure progress ot work effort & adherence to standards. Tools: X-Windows/Motif; C; C++; X.25 protocol; TCP/IP; Java; JavaScript; UNIX, Windows. Bachelor's degree in Comp Sci., Engineering or Information Technology* +1 yr exp in job offered or as Programmer req'd. (*Bachelor's degree in any engineering field + 1 additional yr exp in software development also acceptable) Previous exp must include Java, C, GUI design X.25 40 hrs/wk, 9am-5pm, $63 990/yr Submit resume to: Bureau of Workforce Program Support PO Box 10869, Tallahassee, FL 32302-0869 Job location Temple Terrace, FL. Job order #FL-2030662



St. Jude Children's Research Hospital, an internationally renowned healthcare institution, combines scientific research with leading edge technology to provide cures for children with catastrophic childhood diseases.

We have recently embarked on an exciting and ambitious series of projects to deploy advanced clinical and research systems to support our patient care and research activities. Our vision is to implement a "paperless" medical records system by the year 2002. New networks, infrastructure, databases and client server tools have opened up exciting opportunities for highly skilled managers and directors who would like to join our rapidly growing IT Division.

Director of Customer Service and Applications

Serve as active team leader in the IT Services Department directing user needs assessment, strategic planning, priority setting, resource utilization, continuous performance improvement activities and project management. You will provide effective management and leadership over clinical, financial and administrative information systems and project to ensure objectives are met, users are satisfied and resources are deployed cost effectively. This position requires a Master's degree in business administration, computer science or healthcare related field and 10+ years experience supporting and implementing systems in a healthcare setting. At least 5 years management experience essential. Excellent supervisory and management skills are critical. **(Job Code: ITC-3930)**

Director of Software Development

You will lead and manage the development and maintenance of software applications and current projects under development including research protocol databases, specialized research applications, and information warehousing. Web technology used by St. Jude Children's Research Hospital for Internet, Intranet and Extranet activities are also included. Master's degree in computer science and/or management information systems or related area is required along with 10+ years experience in technical development including 5 years in a systems management role. Thorough knowledge of new and emerging technologies and system architectures essential. Must have the ability to direct and motivate staff while delivering results in a deadline driven environment. **(Job Code: ITC-3938)**

Manager of Customer Support - Administrative and Financial Systems

You will participate and lead the implementation, coordination, evaluation and ongoing first line support of all administrative and financial systems including the management and evaluation of staff and resource utilization. A Bachelor's degree in Management Information Systems, Administrative/Financial specialty or equivalent required. Master's degree preferred. A minimum of 8 years experience in IT or administrative/financial area including 5 years IT experience and 3 years IT supervision essential. Experience with large, complex, integrated administrative and/or financial IT a must. Hospital information system background preferred. **(Job Code: ITC-2899)**

Manager Customer Support - Patient Care Systems

This position is responsible for the overall customer satisfaction for users of the patient care information systems. You will coordinate, lead and participate in requirements, implementation, evaluation and ongoing first line support and be responsible for the integration of systems across departmental boundaries to ensure solutions are consistent with the institutions overall goals and objectives. In addition, you will manage and evaluate staff and resource utilization. Requirements include a Bachelor's degree in Management Information Systems, Patient Care or Clinically related specialty such as Nursing, Pharmacy, Laboratory Medicine/Pathology, Respiratory Therapy or equivalent. Master's degree preferred. A minimum of 8 years experience in IT, patient care or clinically related specialty such as Nursing, Pharmacy, Laboratory Medicine/Pathology, Respiratory Therapy, etc. including 5 years of IT experience with 3 years of IT supervision required. Experience with large, complex, integrated patient care information systems essential. Clinical Information System background preferred. **(Job Code: ITC-2893)**

St. Jude offers professional growth opportunities, competitive salaries and a comprehensive benefits package. Please e-mail, fax or mail your resume (INCLUDING JOB CODE) to:

St. Jude Children's Research Hospital, Human Resources Department, 332 North Lauderdale, Memphis, TN 38105
E-mail: lisa.martin@stjude.org Fax: 901-495-3123

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Manager of Computer

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Software Engineer

to analyze, design, develop and implement multi tier client server and distributed applications on UNIX (HP-UX or Solaris) and NT; gather requirements, recommend Hardware, design using UML and object oriented methodologies, write design, user and API documentation, deploy, support and train users; implement applications using Java, C++, C and use CORBA, Java RMI, COM with Oracle and Pse-Pro database; integrate and deploy over Internet using Apache and IIS web servers, HTML, XML, Java Servlets/Applets, JSP, CGI/Perl and JavaScript. Require: MS in Computer Science or any discipline of Engineering with one year experience in the software industry. Salary: 85,000/year, full time. Please send resumes to Innerspace Solutions, Inc. P.O.Box 11, Acworth, GA 30101

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SOFTWARE ENGINEER to design, develop, test and maintain three tier distributed object oriented application software using Rambaugh and Booch Object Oriented Methodologies and Rational Rose; Architect, design and develop middleware communication infrastructure software between Mainframe, Unix server and PC Windows using C++, IBM Message Queues (MQ), Encina, DCE and CICS; Lead Business Use Cases and Scenario development; Develop distributed GUI client-server applications using C++, C, Visual C++, SQL, DB2, Oracle, CICS, Perl and Continuous. Require: M.S. degree in Computer Science or an Engineering discipline with one year of experience; Require extensive paid travel on assignments to various client sites. Salary: $77,000 per year, 8:00 am to 5:00 pm, M-F. Send two copies of resume to Case #19983000, P.O. Box 8968, Boston, MA 02114

SOFTWARE ENGINEER to design, develop, test and implement Web-based application software using Visual Basic, Crystal Reports, MS Access, Visual Interdev, HTML, JavaScript, VBScript, Active X, and Active Server Pages on Windows and Windows NT platforms. Require: Bachelor's degree (or equivalent) in Computer Science, with two years of experience in the job offered or as a Systems/Programmer Analyst. Three years of college/university education with an additional three years of work experience in the field will be considered equivalent to the Bachelor's degree in Computer Science. Extensive travel on assignments to various client sites within the U.S. Salary: $65,000 per year, 8 am to 5 pm, M-F. Send resume to: Gary Herron, Branch Manager, Compuware Corporation, 212 South Tryon St., Charlotte, NC 28281. Attn: Job AM.

Software Engineers (2 positions) to manage and generate software requirements, design, develop and test state of the art integrated on demand services IP/ATM switch (supporting ISUP, ISDN, SGCP/MGCP, MF-R2 protocols and North American Numbering plan) providing ATM-TDM, TDM-ATM, TDM-TDM, TDM-IP, IP-TDM, IP-ATM, ATM-IP, ATM-ATM, IP-IP interconnections using Object Oriented Methodology and Structured Methodology in C, C++, and CORBA; design, develop and test call processing, SS7 (ISUP & MTP) and feature development (Call Forwarding, LNP, Call Waiting etc.) for Integrated on demand services (voice, multimedia etc.) over IP/ATM switch. M.S. (or foreign equiv.) in Comp Sci or any branch of Engineering with 3 yrs experience required. A B.S. (or foreign equiv.) in any of the above mentioned field with 5 yrs of relevant progressive experience will also be accepted. Salary $60K - $80K pa, 40 hrs/week. Send resumes to Softplace Technology, Inc., 1301 Deer Trail Road, Birmingham, AL 35226.

Software Engineer to provide technical support for production environments, Mainframe-to-Mainframe, Mainframe-to-UNIX, and Mainframe-to-Stratus. Design and develop enhancements to existing architectures to support new business requirements. Participate in technical direction to provide architecture solutions to meet business requirements. Maintain close working relationship with other business client application groups, providing consultation services, test support and configuration, and problem resolution. Requires Bachelor of Science Degree in Computer Science, Information Systems, or Business and three (3) years experience in job offered or three (3) years experience developing on-line financial applications in a Mainframe environment. Candidate must also possess demonstrated expertise developing API links using Cobol or Assembler; demonstrated expertise architecting systems rules for on-line financial applications; demonstrated expertise debugging applications software using Interetest, Abend-Aid or Omegamon; and demonstrated expertise performing data modeling and database design. Salary: $71,675/yr; Mon-Fri, 9:00AM-5:00PM. Submit two (2) copies of resume to: Case Number 19983016, P.O. Box 8968, Boston, MA 02114. EOE. Applicants must be U.S. workers eligible to accept employment in the United States on a full-time basis.

NetGuruSystems, the 2nd fastest growing Technology Company in the 1999 New England Fast-50, currently has multiple openings in each of the following programs:
Senior software Engineers - Lead a development team in design, development, testing of internet, database applications using C/C++ or VB6, Java, Active Server Pages, or database administration of Informix, Sybase or Oracle; Require Master's or equivalent with 1 - 2 years experience.
Software Engineers - Design, develop Internet applications, database applications using Interdev, VB, HTML, JAVA, JDBC, JDK, JavaScript, SQL with backend (SQL Server or Oracle) or Database Administration (SQL Server, Oracle); Require Bachelor's or equivalent with 1 - 2 years experience.
QA Test Engineers - Perform automated or manual software testing and QA using any tool (Win Runner or QA Partner or SQA Robot); Require Bachelor's or equivalent with 1 - 2 years experience.
Technical Resource Managers - Actively manage the Marketing, Sales and Support of company's technical services and products; Require Master's degree or equivalent with strong technical IT background. Please Forward resume to Netguru systems, Attn: HR-LC-CW, 240 Bear Hill Rd., Ste 101, and Waltam, Ma 02451

Senior Solutions Engineers & Senior Software Engineers needed by Boston, MA Co. involved in the Dsgn & Dvlpmt of state of the art speech recognition technology. Both positions require a Masters Degree in Computer Science or Engineering or related field together with industry experience in software development. Respond by resume to: HR Dept., SpeechWorks International, Inc. 695 Atlantic Ave. 2nd Flr, Boston, MA 02111.

Worldwide provider of SAP services is seeking to fill the position of Sr. Consultant (SAP environment). Qualified applicant must have a Bachelor or equivalent in Computer Sc., Computer Eng., Math or Business Admin. & 3 yrs. relevant exp. Applicant will provide SAP services to company clients utilizing SAP R/3 & database design to configure SAP software for customers' financial modules; design, implement & administer complex client-server solutions, including infrastructure, organizational structure, integration with existing information systems, & educating client employees; coordinate project management, implementation of company software & provide support solutions to business processes; initiate & coordinate key activities for achieving group success, & provide leadership for development of SAP products. Send resume to Managing Director, Magnus Management Consultants USA, inc., 3340 Peachtree Rd., Suite 2310, Atlanta, GA 30326

SOFTWARE ENGINEER:

Experience in System Analysis and design in distributed database application; Demonstrated ability to work with Sybase & Replication server under Sun Solaris and HP UX; Proven ability in leading the team and in project management from system study to implementation of the system. The job duties are: Analysis of current procedures and problems to refine and convert the data to programmable form; determine output requirements; study existing system to evaluate effectiveness; upgrade system presently in use; develop, test and implement new software; correct systems/programs as necessary. Requires Masters in Mathematics (or) Computers (or) Science with six months of experience in software development. 40 hours per week at $ 75,000/- per year. Please send resumes to Case #19982981, PO Box # 8968, Boston, MA 02114.

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- Lotus Notes (Developers & Administrators)
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All positions require strong communications & interpersonal skills. Please send resume including salary requirements to:

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SAP Consultant (multiple openings) to consult with client to define business need or problem relating to financial/accounting application; analyze business processes & document flow, & prepare functional specifications for same; design, develop & customize information structures using SAP (Systems, Applications & Products) module; perform data conversion from existing system to newly defined SAP system; assist in implementation of solutions; & report findings & recommendations to client; Reqs. Master's in Comp. Sci., Comp. Engg., Electronics Engg., Systems Analysis, Comp. Info. Systems, Mgmt. Info. Systems, Financial Info Systems, Bus. Admin., Management, Finance, Accounting, Statistics or Math or its foreign educ equiv plus 1 yr exp in job offered or 1 yr related exp as Programmer, Programmer Analyst, Systems Analyst, Systems Analyst/SAP, S/ware Engr. or Consultant; $56,500/yr, 40 hrs/wk, 8a-5p. Send resume or CV to The Phila. Job Bank, 444 N. 3rd St. - 3rd Fl., Phila, PA 19123, J.O. # 6029201

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PROGRAMMER ANALYST with 2 years of industry experience to design and develop software applications. Excellent communications and a Bachelor's degree required. Fax resume to: Tina (781)932-0895 or email: tbetti@raymondkarsan.com
EOE M/F/V/D

PROGRAMMER ANALYST sought by Computer Services Co in Holmdel, NJ. Must have Bach in Comp Sci, Comp Engg or Comp Info Sys & 1 yr exp planning, dvlpg, testing & documenting comp s/ware using C/C++ & Visual Basic in Win NT envrmts & dvlpt of Internet/Intranet applics using HTML. Respond to: HR Dept, Integrated Solutions, 2124 Highway 35, Holmdel, NJ 07733.

Systems Analyst/SAP (multiple openings) to analyze business & document posting requirements; prepare functional specifications for the business processes; customize/modify the SAP (Systems, Applications & Products) system; & provide user training of SAP software; Reqs. Bachelor's in Comp. Sci., Systems Analysis, Comp. Info. Systems, Mgmt. Info. Systems, Systems Mgmt., Bus. Admin., Management, Mech. Engg., Industrial Engg., Manuf. Engg., Comp. Engg., Electrical or Electronic Engg., Statistics or Math or its foreign educ equiv; $56,500/yr, 40 hrs/wk, 8a-5p. Send resume or CV to The Phila. Job Bank, 444 N. 3rd St. - 3rd Fl., Phila, PA 19123, J.O. # 5029187

Software Engineer (2 openings): Design, develop and implement computer software systems using PeopleSoft and related software. Work requires extensive travel and frequent relocation. Must have 1 year of experience as Software Engineer or as a computer professional as well as 1 year of experience using PeopleSoft and related software. Bachelors degree in Computer Science/Applications, Engineering, Math, Physics, Chemistry or business related field. Salary is $85,000.00 per year, 9am ñ 5 pm. Send resumes, referencing Job Order 1029373, to Mr. Terry Kinney, Manager, Armstrong County Job Center, 1270 N. Water Street, P.O. Box 759, Kittanning, PA 16201.

Sr. Systems & Network Architect needed for NJ IT Co. to design system/network architecture for production systems & train/lead administrators/ operators. Apply to: Global Consultants, 601 Jefferson Rd, Parsippany, NJ 07054.

Database administrator wanted by Electronics Mftr in Secaucus, NJ. Must have Bach in MIS, Comp. Science, Elect Engg or Physics & 3 yrs exp. Respond to: MECA HR (DA), Panazip 3C-6, 1 Panasonic Way, Secaucus, NJ 07094.

Programmer Analyst (multiple openings) to analyze, design, develop & document computer applications using Oracle Manufacturing v10.6, Designer 2000, Developer 2000, Forms 4.5, Pro*C, PL/SOL & SOL*PLUS with Oracle 7.x & 8.0 & operating system HP UNIX running on HP 9000; Reqs. Bachelor's in Comp. Sci., Systems Analysis, Comp. Info. Systems, Computer Engg., Comp. Sci. & Engg., Electrical or Electronic Engg. or Mathematics or its foreign educ equiv.; $56,500/yr, 40 hrs/wk, 8a-5p. Send resume or CV to The Phila. Job Bank, 444 N. 3rd St. - 3rd Fl., Phila, PA 19123, J.O. #7058464

Applications Programmer

Design and develop ActiveX components, including ActiveX controls, EXEís and DLLs, for Visual Basic 5.0 and 6.0 applications. Object Oriented implementation. Must have at least an MS degree in Computer Science or CIS or related degree, and 6 mos. of exp. in above position or 6 mos. exp. as Software Developer or related position w/ability to use: Object Oriented Analysis Tools, Visual Basic 5.0, Access and DB2 Database, and Crystal Report. 40.0 hr/wk. $54,000/Yr 9:00 AM -5:00 PM.

Applicants send resume to:
Richard Conrad, Program Manager 300 Grimes Bridge Road Roswell, GA 30075

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Software Engineer to design, develop and test computer software for business applications, applying principles and techniques of computer science, engineering and mathematical analysis. Analyze software requirements for feasibility of design and hardware interface. Design and direct software system testing procedures. Implement, administer and upgrade Oracle Financials ERP Suite 10.7 and customize forms and reports using expertise in Developer 2000, PL/SOL, SQL* Forms and Oracle 7.X administration. Requirements: Masters Degree in computers, engineering or related field and three years experience in software engineering, computer programming or computer research, or a Bachelors Degree and five years progressive experience. Knowledge of Oracle Financials ERP Suite 10.7, Developer 2000, PL/SOL, SOL* Forms and Oracle 7.X administration. Salary: $90,000/yr. Working Conditions: 8:00 a.m. to 5:00 p.m., 40 hours/week. Apply: Mr. Clem Pizzutelli, Manager, Uniontown Job Center, 32 Iowa Street, Uniontown, PA 15401. Refer to Job Order Number 1029371.

Software Engineers design, specify and develop communications interface for embedded control building mngmnt s/w based on LonWorks. Requires 3 yrs exp develop embedded controller products for LonWorks network and microprocessor technologies using C/C++ and Neuron C, incl. 1 yr develop Interface for industrial real-time automation and design distributed processing control systems; Apply to: Human Resources, Andover Controls Corp., 300 Brickstone Square, Andover, MA 01810. Fax 978-470-0946. Email: jobs@andovercontrols.com

Pharmaceuticals Mfg Co in Suffern, NY seeks to fill the following job openings:

i) Systems Analyst/Manager, Production Systems Development- Must have BS in Comp Sci & 5 yrs exp in systems analysis.
ii) Programmer/ Database Administrator-Must have BS in Info Systems & 2 yrs computer exp.

Respond to: BB, HR, Novartis Pharmaceutical Corporation, 25 Old Mill Rd,
Suffern, NY 10901.

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Investment Management firm seeks a Software Engineer for trading systems to provide 24/7 hardware and software support for the computer system utilized by the company's commodity/ currency trading desk. Duties also include developing software interfaces linking the trading desk with research and accounting groups, writing and customizing software programs for the trading desk and supporting/ maintaining existing trade programs. Master's degree in Computer Science required. 1 yr exp in job/duties or 2 yrs. exp as Software Engineer designing/ implementing performance monitoring systems & developing user interfaces. Salary according to experience. Send resume including current salary to RTC, 600 Route 25A, East Setauket, NY 11733, Attn: HFTZ

SOFTWARE ENGINEER:

Design and development of UNIX Scripts and Sybase Stored Procedures to load, analyze, aggregate and extract data from Corporate Data Warehouse onto the local DataMart. UNIX Scripts are written to automate and schedule the above-mentioned tasks. Must develop application tools utilizing UNIX, Shell Scripts, Sybase, GUIs in VisualBasic and Report Development using Crystal Reports, Requires: B.S. in Computer Science. Demonstrated ability in Client/Server deveolpment using UNIX, Sybase, C and Visual Basic. Must have at least five years experience in software development including one year experience in developing Data Warehouse technology. 40 hrs/sk (9 to 5); $68,000/yr. Send two resumes/response to Case #19983023, Box 8968, Boston, MA 02114

Development Engineer: Work with cross-department project teams to analyze and develop requirements for electronic product solutions. Develop application program features and analyze existing software for performance and maintainability. Implement plans for the technical maintenance and enhancement of products after their initial launch. Work with the development staff, including Quality Assurance and Customer Support, to troubleshoot and fix bugs discovered during or after the development process. Must have BS or equiv in Comp Sci or related field and knowledge of RDBMS application tools including PL/SQL and Oracle as well as of RDBMS system development techniques. Respond to: H.R. Dept., Peterson's 202 Carnegie Center, Princeton, NJ 08543-2123. No calls.

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Software Engineer wanted by Comp Services Firm in Chelmsford, MA. Must have Bach in Comp Sci & 3 yrs exp dvlpg financial applic s/ware with Oracle, VB, C/C++. Respond to: HR Dept, General Applied Technologies, 121 Brick Kiln Rd, Chelmsford, MA 01824.

MBNA Hallmark Information Services, a subsidiary of a major national bank, is actively interviewing for a limited number of openings in its Distributed Operations department in Newark, Delaware. LEAD DATABASE ENGINEER I * Must have a bachelor's degree in a quantitative discipline and five years of experience as a database engineer or in a related field. Must have experience with UNIX and Windows NT. Competitive salary and benefits package offered. Send resume, referencing code no. N68001006, to MBNA 1100 N. King St., Wilmington, DE 19884-3638.

Programmer/Analysts wanted by investment banking company in Greenwich, CT. Must have a Bachelor's in Computer Science or Electrical Engineering and 2 years experience analyzing, designing, developing, coding, testing implementing, enhancing and maintaining real-time financial systems used to analyze, price and trade domestic and International securities, utilizing distributed object oriented programming, Windows NT, Unix/C, C++ and a relational database management system. Respond to Dave MacWilliams, Greenwich Capital Markets, Inc. 600 Steamboat Road, Greenwich, CT 06830.

DSP SOFTWARE ENGINEER

to research, design and develop next generation DSP/Modem products using Matlab and C++ under Unix and Windows NT environments to simulate performance of complex detection schemes involving adaptive equalization, Viterbi channel decoding, and frame synchronization; Develop, test and fine-tune optimized ADSL modem signal processing algorithms on fixed-point DSP processor using DSP assembly language and timing critical parts implemented using ASIC which involves VHDL design, MTI VHDL simulation and Synopsis VHDL design compilation. Require: M.S. degree in Computer Science, an Engineering discipline, or a closely related field with two years of experience in the job offered or in research, design and development of data communications applications such as modems and wireless communications. Extensive travel on assignments to various client sites within the U.S. is required. Salary: $87,000 per year, 9 am to 6 pm, M-F. Send resume to: Branko Terkovich, Director, Engineering Services, Engineering Resource Group, Inc., Powder Mill Plaza, 101 Gibraltar Drive, Morris Plains, NJ 07950. Attn: Job BW.

Consultant sought by Florida based Comp S/ware Service Provider for position in Boston, MA. Must have 2 yrs s/ware exp. Respond to: HR Dept, Cantfield Outsourcing Inc., 2449 First St, Fort Myers, FL 33902.

ORACLE/SOFTWARE ANALYST: Design, develop & implement business software applications using Oracle tools and UNIX. Registration of applications using Application Object Library. Bachelor's in Computer Science, Electronics Engineering or related field. 1 yr. exp. specializing in Oracle. Please send (or fax) resume to: Stephane Wynter, Hearst Distribution Group, Inc., 250 West 55th St, NY, NY 10019, fax 212-765-7807.

SOFTWARE DEVELOPER: Writes test scripts and User Interfaces for a network test tool using TCL/TK. Develops networking software using C/C++ and application level GUI using MFC, Visual C++ in Windows 95 and NT. Develops device drivers using C and NDIS in Windows NT 4.0. Requires: M.S. in Computer Science or EE or a B.S. in Computer Science or EE with two years experience in a software development position. Must have knowledge as evidenced by course work or experience in C/C++ and GUI development as well as socket programming and TCP/IP. 40 hrs/wk (9 to 5); $65,760/yr. Send two resumes/response to Case#19982916, Box 8968, Boston, MA 02114.

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Computer Support Consultant-Litigation sought by Counselors at Law in Philadelphia, PA. Must have Bach or equiv in Comp Sci, Info Sys, Business Admin or related field & 3 yrs exp assisting on product dvlpt, dvlpg custom templates to facilitate specific kinds of litigation work with JFS Litigator's Notebook. Respond to: Jodi Cauvin, Morgan Lewis & Bockius LLP, 1701 Market St, Philadelphia, PA 19103-2921.

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DB Administrator needed for Informix relational DB admin & prgmg, shell script prgmg & web applic dvlpmt. Apply to: R. Gorga, Bluestone Consulting, 1000 Briggs Rd, Mt. Laurel, NJ 08054.

Senior Software Engineer:

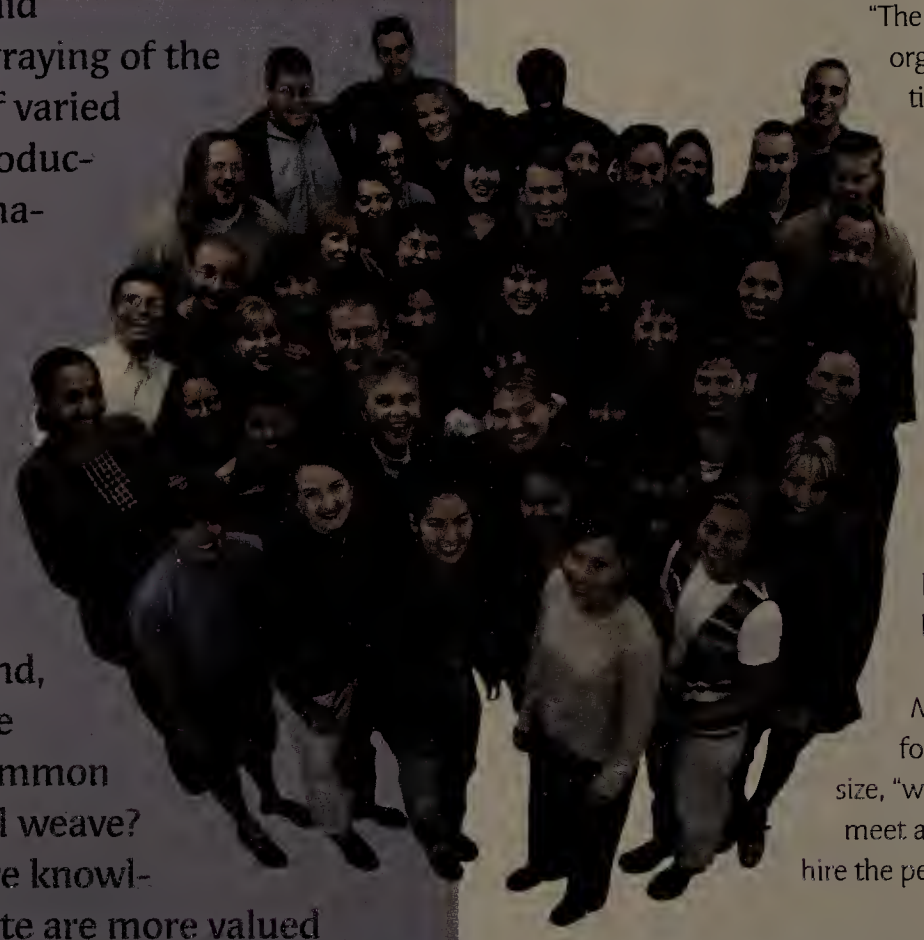
Design, develop and implement software systems to determine feasibility of design and directs software testing procedures, programming and documentation. Work requires extensive travel and frequent relocation. Must have one year of experience in job offered or as a computer professional as well as one year of experience using BaaN. Masters degree in Computer Science/Applications, Engineering, Chemistry, Math, Physics or a business related field. Will accept Bachelors degree with five years of progressive experience as computer professional. Salary is $105,000 per/yr, 40 hrs/wk., 9:00-5:00 p.m. Please submit resumes to: Mr. Tom Dembosky, Manager, Indiana Job Center, 350 N. Fourth Street, Indiana, PA 15701. Reference Job Order No. 1029378.

DIVERSITY in IT CAREERS

by Carole Hedden

While many long-standing, staid professions struggle with the graying of the experts and blending people of varied backgrounds and ideas into productive teams, the world of information technology is different.

In the IT world, diversity is the dominate thread in meaningful innovation for customers. The workforce is relatively young, where experts are as likely to be in their 20s as in their 40s. Education, background, ethnicity, ideas — all are diverse among IT professionals. The common threads in this rich professional weave? An international mindset where knowledge, ideas and ability to execute are more valued than anything else.



Aetna
Hartford, CT

Aetna has long been known in the insurance world, but in the past decade the company has emerged as an information technology powerhouse. Today more than 3,000 IT professionals work at Aetna, where diversity efforts focus on inclusion to achieve innovation.

Carole Pincavage, head of corporate applications, says Aetna, long-known for creating a sense of community amongst its employees, has aggressively sought to heighten employee awareness that diversity of people and ideas plays an essential part of building a thriving employee community and in achieving business success.

This is especially true for Aetna's IT organization. Like most companies today, technology is the central platform for business innovations. For an IT organization to develop and implement these innovations, new ideas, different perspectives and experiences are necessary. Pincavage points out that Aetna's IT organization fosters the exchange of ideas and the welcoming of diversity in a number of ways, at both its leadership and grass root employee levels.

Senior leadership sponsors diversity forums both within and outside the company, has overhauled its project management assignment process to include team diversity and has funded college internships focused on diversity students. But the real strength of Aetna's IT efforts comes from employee-led groups. Aetna has had employee networks for African-Americans, Hispanic, Vietnamese and gay and lesbian employees since 1995. These networks sponsor events that couple diversity awareness and involvement with Aetna's sense of employee community.

The IT group has gone a step further and created an IT Diversity Forum to focus on IT-specific opportunities. The Diversity Forum spearheads initiatives such as special cultural events and IT-focused speaker sessions, and takes the lead in community outreach.

"The reward of these diversity efforts is a stronger organization, more representative of the communities where we do business and the increase in the number of ideas we are able to implement on behalf of our customers," says Pincavage. She notes that as the foremost healthcare company and a premier financial organization, "we often develop technology enhancements that become industry standards, such as our Intelihealth website and our trademarked Doc Find that enables Aetna US Healthcare members to select network physicians online. "Without the knowledge our own diverse employees provide, we would have less insight into the needs of our 20 million healthcare members," she says.

Maura Kearney, human resources team leader for Aetna IT, points out that because of Aetna's IT size, "we are able to hire opportunistically. When we meet a strong candidate, we often have the capacity to hire the person and find challenging work."

Opportunities exist in operational areas, such as computer centers and in networking, but also in application development where IT experts work closely with Aetna's business units to develop technological answers to business specifications. Kearney says the work undertaken at Aetna frequently becomes the national standard from a technical perspective and from a business stance. "Our Doc Find is a good example," says Kearney. "If one of our 20 million members need to find a doctor, we have an electronic database that provides that directory in one source. It's the industry standard."

Pincavage says the diverse pool of IT employees at Aetna receives a wealth of learning opportunities, internally as well as through outside education and conferences. "There's also a tremendous amount of ability to move around internally, to take on new positions and to gain all different kinds of experiences," she adds.

"Aetna is as diverse as the community where we live," says Kearney. "We have a welcoming group that works hard, is committed to the business but that also celebrates uniqueness and accomplishment."

There are opportunities with Aetna offices throughout the country. However, the key technology centers are located in Hartford, CT, Bluebell, PA, and Jacksonville, FL.

Microsoft Corporation
Redmond, WA

LaVonne Dorsey, the diversity recruiting strategy specialist at Microsoft, has a mission in life. She moves in a circle of professional organizations that reflect the diversity of society—from the National Society of Black Engineers to the Society of Hispanic Professional Engineers to Women in Technology International. Through them, she gauges how highly talented potential employees respond to the company, and whether the company is succeeding in attracting the best and the brightest.

"We initially do a phone screen. We seek people who will succeed so our interview process focuses on things you have done and accomplished in your

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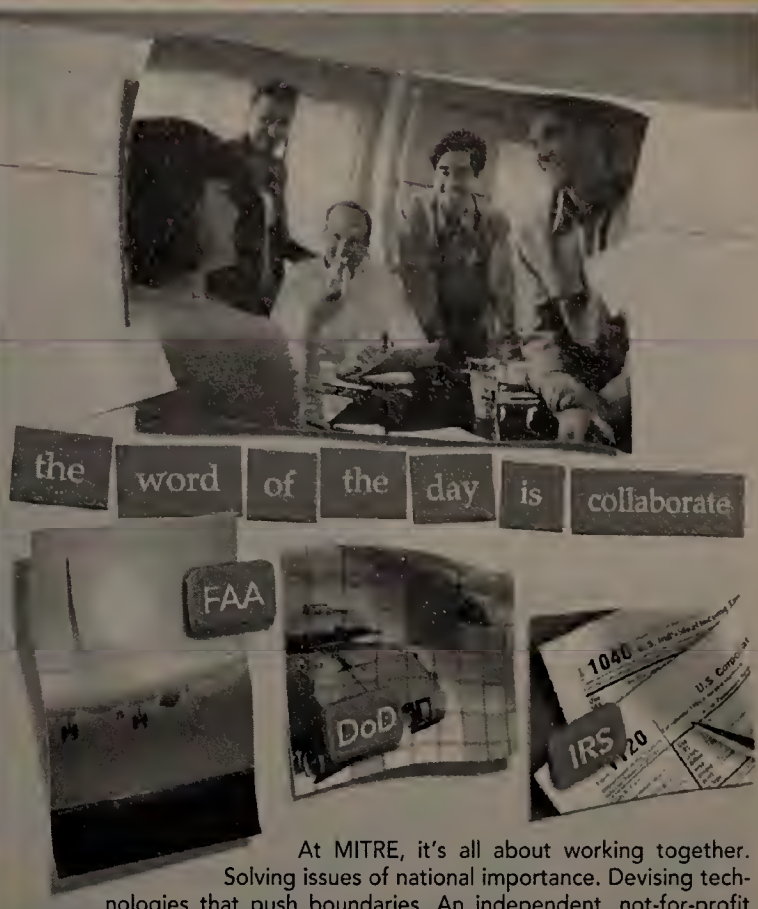

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DIVERSITY in IT CAREERS

career in technology. We want information that shows how you adapt, take leadership, and accomplish great things," says Dorsey.

"We've found that what may be thought of as extreme in traditional business – appearance or culture – really doesn't matter at Microsoft," says Dorsey. "It's about your skills and helping your team move forward.

Microsoft is a place where you control your own destiny. You lead your own career. And we support that independence." Independence is reflected in Microsoft's approach to continuous learning, too. The company offers a self-motivated and self-directed learning program that incorporates online, classroom, one-on-one and external resources.

"This is not a corporation that believes anyone needs to be taken care of," stresses Dorsey. "We focus on skills not time in grade. We have a lot of lateral movement and complete change of careers. Again, you can go for what you need or want."

The MITRE Corporation
McLean, VA & Bedford, MA

While dot-coms and industry push and shove through competition in the IT world, The MITRE Corporation is a stand-alone. This government-sponsored firm provides top level systems architecture and information systems support to government agencies. It's an environment rich in intellectual appeal, while implementation and execution are at the heart of the operation.

Bill Albright, director of Work Quality of Life, says MITRE works primarily with the Internal Revenue Service, the Department of Transportation (FAA) and the Department of Defense. "We operate in the public interest as a not-for-profit," says Albright. "Our role is to assure that, in our areas of expertise, the government's money is being spent on getting solutions to very important problems.

"That same philosophy spills over into how we manage people — we are public-interest oriented and want our organization to look like the country's population," Albright says. "With the changing demographics occurring in society, we clearly are on a mission to make certain we cultivate a work environment to make us as attractive as possible to a future workforce that will be heavily dominated by women and people of color."

MITRE is a company of computer scientists and electrical engineers working in the web, networking, signal processing, software engineering, systems engineering, architecture and development environments. The company organizes around its customer base — the US Air Force, other Department of Defense entities, the Defense Information Systems Agency, the IRS and others. "We do hire new college graduates, but the majority of folks have the experience that allows MITRE to offer government agencies the sound judgement needed to shape technical decisions," Albright notes.

"This is a collegial work environment where people grow through their collaboration on important projects," Albright says. "We supplement this learning with The MITRE Institute, which sponsors technology program training, and management, leadership and diversity training. The institute assists us in staying on the cutting edge, but we also offer tuition reimbursement."

MITRE's two primary sites are in McLean and Bedford with approximately 60 sites located worldwide.

Network Appliance, Inc.
Sunnyvale, CA

At the foundation of the data explosion is the ability to store information in a meaningful way. That's the basis of work undertaken by NetApp — Network Appliance, Inc. "Essentially, we've made adding storage as easy as plugging in a new appliance," says Chris Carlton, NetApp's vice president of human resources. "It plugs in and it works, adding tremendous amounts of storage in a Windows or UNIX environment."

NetApp faces doubling its workforce and its revenues every year, as it has done for the past four. "We've encouraged diversity from the start," says Carlton, who points out that the company grew from 70 employees five years ago to more than 1,200 at the end of 1999. This number will double again by year-end 2000. "We talk about diversity not just in terms of appearance but in thinking and ideas. We must value these if we want to continuously change, double in size and work with the variety of mindsets of our customers."

Doubling in size every year means employees basically work for a different company every year. "What's demanded, what's required, the technology used — all that changes every year with this kind of growth," Carlton says. "We introduce new products every quarter, and we're moving out of rented space into buildings going up next to our new headquarters — adding almost a million square feet to manage our ongoing future growth."

To maintain the growth edge, NetApp offers learning on the job through a collaborative organizational style, as well as through a number of external organizations. "You'll be working with the best and brightest here, so you'll learn from the people with whom you work. We supplement this with development courses and the constant expansion of new jobs. You're limited only by your own desire to try something completely new."

NetApp looks for people with experience in a wide range of technologies, Windows NT, Unix, storage, networking, file technology and who have implementation skills. In addition to the headquarters in Silicon Valley, NetApp has a remote development site in North Carolina.

"In a lot of companies, you have to figure out the ultimate goal. Here, the direction is clear."

— Kris, IT Systems Manager

Equality. There was a day when that's what diversity was all about. But at Aetna, diversity is about more than fairness alone. It's about good business. And in our view, there's no greater commitment a company can make to its people than to ensure the best of both. That's why here, diversity has as much to do with the success of our bottom line as it does to that of our people. Because with all things being equal, you must have one to have the other. That's why here, diversity is everyone's business.

To learn more about whom we are and what we do, visit us at www.aetna.com

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SBC Communications (L)	-7.8

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America Online	-9.56
NEC	-4.38
Solectron Corp.	-4.06
SBC Communications (L)	-3.44
GTE Corp.	-3.25
Be Inc.	-2.69

Wall Street Looks for Pricey Consultancies

Billing rates used as basis for stock valuations

BY LEE COPELAND

INDUSTRY ALMANAC

WHEN WALL STREET analysts evaluate whether a publicly traded consulting company is a good investment, they look for something information technology shops would rather not see: fees that are high and going higher.

Most IT consultants charge between $100 and $150 per hour for systems implementation work. Yet a new breed of Internet-savvy service firms command much higher rates for the design and deployment of Web storefronts and applications.

"Most of the new business coming on board for [Web] service firms is priced at $225 to $250 per hour," says Moshe Katri, an analyst at SG Cowen Securities Corp. in New York. Like most Wall Street analysts, Katri considers not only billing rates but also the amount of revenue generated per consultant when evaluating such firms. He says hourly rates in the $200 range and annual revenue-per-consultant of at least $250,000 are good signs. "There's a mad rush to stake out the new Web territory, so most service vendors in this space can hand-pick their clients, and their rates reflect that," says Katri.

Stan Lepeak, an analyst at Meta Group Inc. in Stamford, Conn., says annual revenue rates of $300,000 per consultant — once found only at high-level management consulting firms — are now becoming common. "The scale is shifting to the right as rates across the board go up and as supply and demand gets further skewed," he says.

Examples of this trend include high-end Web site design and e-commerce firms Cysive Inc. [Nasdaq:CYSV] in Reston, Va., and Scient Corp. [Nasdaq: SCNT] in San Francisco. Each firm's stock price has climbed steadily on the basis of strong margins and high rates.

For its third quarter of last year, which ended Sept. 30, Cysive reported profits of $862,000 and revenue of $7.3 million — a 182% revenue increase from a year earlier. But it also impressed investors with an average hourly rate of $201 and $390,000 in revenue per consultant.

For its second fiscal quarter, which ended Sept. 30, Scient posted revenue of $31 million, an increase of 895% compared with the same period last year. Scient lost $5.8 million for the quarter, but its stock fared well with analysts as a result of high professional services margins of 54% and revenue-per-consultant of $303,000 for the year. The company doesn't disclose average billing rates.

"Rates are going to go up a lot and, largely, [IT shops] are going to get screwed," says Lepeak. "In general, prices will go up and quality will stay level or go down because there just aren't enough people to go round."

High billing rates aren't the only basis for high stock valuations. Cognizant Technology Solutions Corp. [Nasdaq: CTSH] is widely recommended by analysts because it has a 50% profit margin even though its billing rates are low, says Chairman and CEO Kumar Mahadeva. More than 70% of the Teaneck, N.J., firm's employees are based in India, which helps keep costs low, he says.

EXCH	52-WEEK	RANGE		JANUARY 17, 2000 2 PM	XWK CHANGE	NETWK PCT CHANGE
SOFTWARE UP 9.4%						
A5WX	105.00	12.50	Active Software (H)	80.00	11.50	16.8
ADBE	79.00	18.87	Adobe Systems Inc.	66.56	3.19	5.0
ARBA	211.00	30.50	Ariba Inc.	174.38	5.88	3.5
AZPN	37.00	8.12	Aspen Technology Inc. (H)	35.50	5.75	19.3
ADSK	49.43	17.00	Autodesk Inc	30.00	-1.38	-4.4
AVID	34.25	9.43	Avid Technology	11.75	-0.50	-4.1
BMCS	86.62	30.00	BMC Software Inc.	50.25	7.25	16.9
BOBJ	153.50	16.37	Businesss Objects S.A.	128.63	9.69	8.1
CDN	34.06	9.12	Cadence Design Systems	21.75	-0.38	-1.7
CBT5Y	38.25	8.56	CBT Group Plc.	35.88	4.63	14.8
CHKP	223.50	23.00	Checkpoint Software Tech. Ltd.	218.50	32.75	17.6
CTXS	133.50	26.50	Citrix Systems Inc.	133.50	26.06	24.3
COGN	60.00	19.37	Cognos Inc. (H)	60.00	13.44	28.9
CA	72.00	32.12	Computer Associates Int'l Inc.	65.69	6.19	10.4
CPWR	40.00	16.37	Compuware Corp.	27.25	0.38	1.4
DCTM	63.50	9.37	Documentum	54.06	2.94	5.7
EFII	64.87	32.00	Electronics For Imaging	55.38	6.13	12.4
HNC5	130.00	13.75	Hnc Software	92.06	-2.06	-2.2
HYSL	44.00	9.87	Hyperion Software	34.06	0.31	0.9
IDXC	46.62	12.43	IDX Systems	33.75	4.69	16.1
INFA	109.37	19.00	Informatica Corp.	94.00	-1.13	-1.2
IFMX	14.00	6.03	Informix Software Inc.	10.94	1.31	13.6
INTU	90.00	22.50	Intuit (H)	81.09	7.34	10.0
JKHY	56.50	26.43	Jack Henry Associates	53.00	3.25	6.5
JOEC	43.00	10.87	J.D. Edwards & Co. (H)	40.75	9.25	29.4
LGTO	82.50	15.06	Legato Systems Inc.	59.63	-1.75	-2.9
MACR	88.68	26.37	Macromedia Inc.	79.75	2.13	2.7
MANU	36.00	5.25	Manugistics Group Inc.	36.00	4.94	15.9
MENT	15.06	7.75	Mentor Graphics	13.69	1.81	15.3
MSFT	119.93	68.00	Microsoft Corp.	111.81	2.97	2.7
NETA	57.12	10.06	Network Associates	27.75	3.44	14.1
GMH	116.31	41.25	Network General (H)	116.31	19.81	20.5
NOVL	42.43	16.06	Novell Inc.	34.38	-0.50	-1.4
ORCL	125.18	21.00	Oracle Corp.	108.81	8.69	8.7
PMTC	35.93	11.68	Parametric Technology Corp.	20.13	0.81	4.2
P5FT	27.00	11.50	PeopleSoft Inc. (H)	25.56	0.63	2.5
PIXR	50.62	33.00	Pixar	36.50	1.63	4.7
RATL	58.94	21.87	Rational Software Corp. (H)	58.94	12.88	28.0
RHAT	151.31	20.00	Red Hat Inc.	134.50	12.06	9.9
QSFT	120.00	20.50	Quest Software	86.00	2.00	2.4
SAP	64.50	23.75	SAP AG (H)	62.75	7.00	12.6
SCUR	29.00	2.25	Secure Computing Corp.	17.56	6.00	51.9
SE	44.93	17.93	Sterling Commerce Inc.	30.81	-0.81	-2.6
SSW	32.00	18.12	Sterling Software Inc.	30.13	0.94	3.2
SDRC	23.43	8.81	Structural Dynamics Research	11.44	-0.19	-1.6
SYB5	19.81	5.31	Sybase Inc.	17.38	0.38	2.2
SYMC	69.31	12.50	Symantec Corp.	55.50	5.75	11.6
SNPS	75.62	37.12	Synopsis	56.00	-2.00	-3.4
SCTC	19.50	7.81	Systems & Computer Technology	17.88	3.00	20.2
BAANF	17.81	6.87	The Baan Co. N.V.	7.00	-1.69	-19.4
TIBX	195.00	19.75	Tibco Software Inc.	160.00	39.81	33.1
TSAI	50.87	20.25	Trans. Sys. Arch.	24.13	0.38	1.6
VRTS	158.00	20.37	Veritas Software Corp. (H)	148.00	28.75	24.1
WIND	45.00	11.25	Wind River Systems Inc.	36.56	2.56	7.5
TELECOMMUNICATIONS CARRIERS UP 5.1%						
AT	91.81	56.31	Alltel Corp.	79.63	4.69	6.3
ANOW	23.87	11.00	Andrew Corp. (H)	22.75	3.69	19.3
T	64.12	41.50	AT&T	54.50	5.94	12.2
BCE	98.31	37.31	BCE Inc.	86.00	3.69	4.5
BEL	69.50	50.62	Bell Atlantic	56.06	-2.56	-4.4
BLS	51.37	39.75	Bell South	43.75	-1.31	-2.9
BRW	41.06	16.31	Cincinnati Bell Inc. (H)	37.13	0.44	1.2
CMCSK	57.68	29.00	Comcast	52.09	6.84	15.1
CQ	37.06	15.37	Comsat Corp.	19.19	-0.31	-1.6
COX	52.37	32.00	Cox Communications Inc. (H)	52.31	6.19	13.4
GSTRF	53.75	12.62	Globalstar Telecom. Ltd.	35.25	0.50	1.4
GTE	78.50	57.00	GTE Corp.	65.19	-3.25	-4.7
NXTL	117.37	26.00	Nextel Communications	105.38	9.50	9.9
SPOT	74.25	26.37	Panamsat (H)	69.19	4.63	7.2
QCOM	200.00	7.12	Qualcomm	146.56	2.06	1.4
SBC	59.93	40.56	SBC Communications (L)	40.56	-3.44	-7.8
FON	75.93	36.87	Sprint Corp.	65.75	1.75	2.7
TOS	137.00	46.18	Telephone and Data Systems	109.31	2.69	2.5
USW	73.00	51.50	US Westl	69.56	4.63	7.1
VIA	61.87	35.31	Viacom (H)	58.38	6.63	12.8
WCII	81.50	28.50	Winstar Communications Inc.	80.56	12.19	17.8
WCOM	84.56	40.68	MCI Worldcom Inc. (L)	46.94	-0.88	-1.8
SERVICES UP 4.4%						
ACXM	30.62	14.56	Acxiom Corp.	25.81	0.31	1.2
AC5	53.00	31.75	Affiliated Computer Servs	47.69	4.81	11.2
AM5Y	39.75	19.75	American Mgt. Systems	34.31	4.19	13.9
AUD	54.81	20.87	Automatic Data Processing	51.69	-1.89	-3.2
B5Y5	65.50	41.37	Bisys Group Inc.	65.38	2.38	3.8
CATP	32.25	10.62	Cambridge Technology Ptnrs	22.69	-0.25	-1.1
CEN	40.50	16.62	Ceridian	18.19	-2.83	-12.6
CBR	29.81	13.75	Ciber Inc.	26.13	1.50	6.1
COO	43.00	10.75	Comdisco	36.44	5.19	16.6
CHRZ	28.75	9.25	Computer Horizons Corp.	14.44	0.50	3.6
CSC	94.62	52.37	Computer Sciences	93.13	6.25	7.2
DST	76.43	50.93	Dst Systems Inc.	71.19	1.06	1.5
EOS	70.00	44.12	Electronic Data Systems	66.44	7.44	12.6
FDC	54.25	33.00	First Data Group (H)	51.06	1.31	2.6
FISV	40.75	24.12	Fiserv	37.38	0.38	1.0
IT	25.75	9.56	Gartner Group	16.25	1.38	9.2
KEA	41.25	17.25	Keane (H)	28.38	0.44	1.6
NDC	55.25	21.75	National Data	33.50	1.06	3.3
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SYNT	19.62	7.00	Syntel Inc.	18.16	0.66	3.8
TECD	44.68	14.50	Tech Data	24.25	0.13	0.5
TENF	51.50	17.00	TenFold Corp. (H)	51.38	5.50	12.0
TSS	26.25	14.12	Total System Services Inc	16.13	0.13	0.8
TSAI	50.87	20.25	Transaction Sys. Architects	24.13	0.38	1.6
NETWORK UP 10.3%						
COMS	53.75	20.00	3Com Corp.	46.56	2.19	4.9
ADCT	75.75	34.37	ADC Telecommunications Inc.	74.00	8.56	13.1
ANTC	60.25	18.62	Antec	37.94	7.75	25.7
BNYN	23.87	6.25	Banyan Systems Inc.	19.50	2.38	13.9
CS	29.31	7.18	Cabletron Systems	25.63	1.88	7.9
CNEBF	9.75	2.87	Call-Net Enterprises	4.50	1.08	30.9
CSCO	110.25	44.93	Cisco Systems Inc.	107.56	4.19	4.1
ECIL	45.00	23.75	ECI Telecom	37.00	1.13	3.1
ENTU	70.62	16.87	Entrust Technologies Inc.	62.38	13.19	26.8
HRS	40.62	18.25	Harris Corp.	28.06	3.13	12.5
GMH	116.31	41.25	Hughes Electronics/GM (H)	116.31	19.81	20.5
ERICY	68.59	20.50	LM Ericsson	65.00	5.38	9.0

EXCH	52-WEEK	RANGE		JANUARY 17, 2000 2 PM	XWK CHANGE	NETWK PCT CHANGE
JNPR	384.37	90.12	Juniper Networks Inc.	337.94	19.06	6.0
LU	84.18	47.00	Lucent Technologies	53.75	0.69	1.3
MADGF	10.25	1.43	Madge Networks	6.94	-0.25	-3.5
NCDI	9.00	3.87	Network Computing Dev	8.38	1.63	34.2
NWK	14.81	7.31	Network Equipment Tech.	9.75	1.75	15.2
NN	39.87	14.00	Newbridge Networks	25.31	3.06	13.8
NOK	196.50	62.31	Nokia Corp	182.38	15.38	9.2
NT	110.06	25.18	Northern Telecom Ltd.	96.50	4.88	5.3
PAIR	18.56	7.93	Pairgain Technologies Inc	11.44	0.89	5.7
PCTL	11.00	3.25	Picturetel	5.06	0.47	10.2
SFA	66.50	24.50	Scientific Atlanta	57.63	6.63	13.0
TLAB	77.25	35.87	Tellabs Inc	70.19	5.75	8.9
U5W	73.00	51.50	U5 West	69.56	4.63	7.1
VRLK	5.43	1.81	Verilink	4.69	0.56	13.6
W5TL	13.00	3.81	Westell Technology Inc.	10.44	0.69	7.1
SEMICONDUCTORS, CHIPS & EQUIPMENT UP 16.4%						
ADPT	62.75	19.00	Adaptec (H)	60.25	3.38	5.9
AMD	39.75	14.56	Advanced Micro Devices (H)	39.75	7.75	24.2
ALTR	68.56	23.93	Altera	59.63	8.38	16.3
ADI	98.88	24.37	Analog Devices (H)	98.88	13.06	15.2
AMAT	136.31	48.43	Applied Materials (H)	136.31	23.00	20.3
ASML	124.38	36.37	ASM Lithography Holding	124.38	24.88	25.0
FCS	34.12	18.50	Fairchild Semiconductor Corp	32.13	5.94	22.7
HRS	40.62	18.25	Harris Corp	28.06	3.13	12.5
INTC	104.13	50.12	Intel Corp. (H)	104.13	24.06	30.1
KLAC	132.50	42.37	Kla Instruments (H)	132.50	30.88	30.4
LLTC	90.31	41.75	Linear Technology (H)	90.31	11.06	14.0
LSI	72.06	17.87	LSI Logic	72.06	11.88	19.7
MXIM	51.75	19.93	Maxim Integrated Products (H)	51.75	2.56	5.2
MU	85.00	34.25	Micron Technology	74.94	4.75	6.8
MOT	153.62	63.31	Motorola	148.81	23.94	19.2
NSM	51.87	8.87	National Semiconductor	49.50	6.69	15.6
STM	160.93	40.25	SGS-Thomson Microelectronics	153.25	24.88	19.4
SLR	98.00	37.25	Solectron Corp.	84.38	-4.06	-4.8
TER	71.38	21.81	Teradyne	71.38	15.31	27.3
TXN	111.50	43.00	Texas Instruments	106.69	14.00	15.1
JOSU	210.75	14.81	Uniphase (H)	195.06	27.63	16.5
VTSS	58.00	20.37	Vitesse Semiconductor Corp	51.88	5.63	12.2
XLNX	49.12	15.31	Xilinx (H)	48.25	3.63	8.1
COMPUTER SYSTEMS UP 5.3%						
AAPL	118.00	32.00	Apple Computer Inc.	101.19	3.94	4.0
ASPX	15.25	3.87	Auspex Systems	7.19	-0.75	-9.4
BEOS	39.56	3.28	Be Inc.	19.88	-2.69	-11.9
CPQ	51.25	18.00	Compaq	31.00	2.69	9.5
DELL	55.00	31.37	Dell Computer Corp.	45.19	-0.75	-1.6
GTW	84.00	26.87	Gateway 2000 Inc.	60.69	-0.56	-0.9
HWP	118.87	63.37	Hewlett-Packard Co.	113.56	10.88	10.6
HIT	164.50	59.93	Hitachi Ltd.	147.50	3.25	2.3
IBM	139.18	80.87	IBM	121.75	9.25	8.2
MUEI	18.37	9.00	Micron	12.69	2.00	18.7
MOT	153.62	63.31	Motorola	148.81	23.94	19.2
NATI	40.00	17.18	National Instruments Corp. (H)	38.88	4.38	12.7
NCR	55.75	26.68	NCR	34.25	-1.81	-5.0
NIPNY	125.00	43.62	NEC	106.50	-4.38	-3.9
PRCM	38.25	3.43	Procom Tech Inc	27.50	7.88	40.1
SGI	20.87	6.87	Silicon Graphics Inc.	9.44	0.19	2.0
SNE	295.87	65.50	Sony	226.06	0.56	0.2
SUNW	83.03	21.87	Sun Microsystems	81.00	10.81	15.4
TRCO	7.25	1.53	Tricord Systems	4.25	-0.31	-6.8
UIS	49.68	20.93	Unisys	30.00	1.06	3.7
INTERNET UP 5.2%						
AMZN	113.00	41.00	Amazon.com	66.78	-1.84	-2.7
AOL	96.00	31.25	America Online	62.50	-9.56	-13.3
ATHM	99.00	33.12	@home Corp.	40.88	2.00	5.1
BAMB	27.75	8.93	Bamboo.com	22.94	2.88	14.3
CKFR	107.50	20.87	Checkfree	84.25	7.68	10.0
CYCH	24.00	6.68	Cybercash Inc.	8.44	-0.13	-1.5
EBAY	234.00	55.37	eBay Inc.	137.50	3.88	2.9
ETYS	86.00	19.68	eToys Inc. (L)	21.25	-1.31	-5.8
EGRP	72.25	17.00	ETrade Group Inc.	28.63	2.06	7.8
LCOS	93.62	28.56	Lycos Inc.	78.44	10.06	14.7
OMKT	49.84	11.18	Open Market Inc.	38.63	2.25	6.2
OTEX	42.50	9.50	Open Text Corp.	18.75	-0.50	-2.6
PCLN	165.00	45.50	Priceline.com Inc.	55.69	-1.56	-2.7
PRGY	50.62	14.00	Prodrgy Communications	20.19	-2.19	-9.8
P5IX	82.47	23.00	PSINet Inc. (H)	82.47	23.34	39.5
R5A5	80.00	14.25	Security Dynamics	72.81	12.69	21.1
SPYG	54.00	8.62	Spyglass Inc.	46.25	2.13	4.8
WINK	65.75	21.75	Wink Communications Inc.	53.00	7.88	17.5
YHOO	500.12	110.00	Yahoo Inc.	356.13	-28.88	-7.5
STORAGE & PERIPHERALS UP 5.4%						
ADPT	62.75	19.00	Adaptec Inc (H)	60.25	3.38	5.9
APCC	29.37	13.12	American Power Conversion	26.00	1.00	4.0
CANNY	40.93	19.25	Canon Inc	39.00	2.50	6.8
DBD	39.87	19.68	Diebold Inc.	24.69	0.31	1.3
EK	79.87	58.62	Eastman Kodak Co.	60.06	2.31	3.7
EMC	117.00	17.25	EMC	112.94	9.88	9.6
IOM	10.12	2.87	Iomega	5.25	0.75	16.7
MXTR	21.25	4.25	Maxtor Corp	8.16	0.03	0.4
NTAP	93.62	19.06	Network Applinace Inc (H)	90.94	14.94	19.7
LXK	104.00	42.06	Lexmark International Group Nc.	89.81	1.38	1.6
SEG	48.81	25.12	Seagate Technology	42.69	2.44	8.1
STK	41.62	14.25	Storage Technology	17.88	1.25	7.5
TEK	42.81	17.56	Tektronix	39.00	1.94	5.2
XRX	63.93	19.00	Xerox	23.38	-0.56	-2.3

KEY: **(H)** = New annual high reached in period
(L) = New annual low reached in period

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Y2K Prophet Comes Down From Soapbox

Disaster averted, Boivin sees lessons in cooperative effort

BY GARY H. ANTHES

Joe Boivin, who abandoned a promising career in banking to lead a crusade in Canada against the Y2K problem, has climbed down from his soapbox and turned his attention to family matters, admitting the problem was greatly overstated.

"I have disqualified myself from giving any . . . advice," he said last week. "The relief that a global crisis did not occur is tainted by a growing belief that there never was a global crisis, despite the multiple sources of confirmation reports. [It's] sort of like waking up one morning and discovering the Earth is flat."

But Boivin, who founded the Global Millennium Foundation (*www.globalmf.org*) to fight the Y2K peril, said he found a silver lining in the Y2K cloud. "Y2K is an excellent example of how people from all parts of the world can come together for a common threat. [There's now] a better understanding of the interdependency of the world and the danger of allowing technology to become a life threatening issue for entire nations." He also hailed "the coming together of competitors in similar industries to work together for a common cause."

Boivin left his post as Y2K project manager at the Canadian Imperial Bank of Commerce in December 1997 to start — with his own funds — the first national program office for Y2K. The Global Millennium Foundation publicized the threat of Y2K and sponsored industry and government efforts in Canada to tackle the problem.

JOE BOIVIN voiced gloom and doom to the bitter end

The foundation published a monthly online newsletter and struck a note of gloom and doom to the end. The November newsletter, the last of 1999, said, "The potential confusion at the turn of the century . . . continues to represent an explosive situation. Accidents and mistakes will continue to happen with ever greater frequency."

But in a reversal of position in January, the newsletter said, "Without taking away from the excellent efforts of many people around the world, the actual results suggest there was never a major Y2K risk for infrastructure elements." It noted however, that "business system results will not surface until later."

Boivin's current assessment stands in marked contrast to that of other Y2K gurus, who continue to insist the crisis was real and extraordinary measures against it appropriate.

Continued from page 1

IT Spending

year, has a required turnaround time of less than six months. Web-based projects must be completed in three months under the company's new, stricter IT project deadlines.

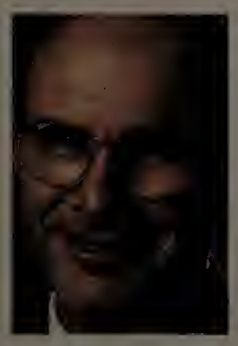
"I think all of us wanted to do a lot of things last year, but we were reluctant to take the focus away from Y2K," said Sears CIO Jerry Miller.

Unlike some other companies that had planned to freeze changes to their systems until February or March, Allstate Corp. had always planned to lift its ban by Jan. 15, said Rich Harris, assistant vice president for the Y2K effort at the Northbrook, Ill., insurer.

Now the company is focusing on the IT aspects of a new business model announced in November that was designed to let customers do business with the company through a variety of channels, including call centers and the Internet. In fact, the company has already begun to roll out new desktops and software packages to its sales agents, said Harris.

Yankee Energy Systems Inc. in Meriden, Conn., began lifting its Y2K lockdown this month, a week early, to focus on its acquisition by Berlin, Conn.-based Northeast Utilities, a deal that's set to close at the end of the first quarter, said Scott Waleski, the company's director of IT and services.

"We'll spend the rest of 2000 focusing on integrating systems," said Waleski.



SEARS CEO JERRY MILLER: Focus is off Y2K

Meanwhile, Atlanta-based Delta Air Lines Inc. rang in the new year with a new CIO, Robert DeRodes, who was recruited from Citibank last summer to become Delta's senior vice president of operations and technology.

Former Delta CIO Charlie Feld, to whom DeRodes will continue to report, is now the airline's "e-leader," a new post in which Feld will focus on forging partnerships and joint ventures with Web-based ticket and travel companies, among others.

Feld also is overseeing projects to bring wireless Internet connections to Delta's airport-based frequent-flier club rooms and to deliver updated flight information to passengers' pagers and cell phone voice mail systems.

PG&E Corp. CIO John Keast saw the company over the Y2K hump, then departed for Branders.com, a San Mateo, Calif.-based Internet start-up that sells customized promotional merchandise on the Web.

Railroad giant Union Pacific Corp. in Omaha is kicking off the year with a multimillion-dollar customer relationship management software project that former Y2K project manager, Tim Brechbill, is heading. The system will centralize all information about the railroad's customers, such as billing information, shipping requirements and locations, into a single system.

The smooth transition to the year 2000 thus far "has been no surprise to us," said Lou Marcoccio, an analyst at Gartner Group Inc. in Stamford, Conn. But one surprise is the speed with which companies have moved their Y2K spending to e-commerce initiatives. Just three months ago, Gartner had predicted that most companies would do so mid-2000. By December, Marcoccio and his group had moved that date up to March.

Credit-Card Y2K Glitch Leads To Some Double-Billing

Some CyberCash users didn't upgrade

BY CAROL SLIWA

Merchants that failed to upgrade to Y2K-compliant versions of CyberCash Inc.'s payment-processing software may have inadvertently double-billed customers this year.

CyberCash Executive Vice President Chuck Riegel said the Reston, Va.-based company began posting information about the Y2K issue on its Web site in December 1998 and mailed notices to registered users of its ICVerify, NetVerify, PCVerify and EZCharge software, telling them they would need to upgrade to Y2K-compliant versions.

Yet some retailers apparently missed the notices. The number of affected consumers and retailers is difficult to determine, but Riegel claimed that the problem is "limited."

Visa International Inc. spokesman Russ Yarrow said his company typically monitors instances of double-billing. He said Visa averages 100 million transactions per day and generally sees 3,000 double-billings. Since the onset of the CyberCash problem, the instances of double-billed transactions have increased to some 6,000 per day, Yarrow said.

American Express Co. and MasterCard International Inc. also said they have been monitoring the problem, but neither company could provide details on the number of affected customers and retailers.

"Our hope is that most of these transactions will never show up on cardholders' statements," said MasterCard spokeswoman Linda Locke.

Rudy Socha, president of WildlifeCollectibles.com in Lorain, Ohio, said he didn't receive notification that he needed to upgrade from either CyberCash or the reseller that sold him ICVerify. Socha said CyberCash's technical support lines were busy during the first week of the year, and he couldn't get through to leave a voice mail message until Friday.

FOR MORE INFO

Upgrades

www.cybercash.com/cybercash/y2k/y2k_upgrades.html
or by calling: **1-800-900-6133.**

Computerworld *reporter Stacy Collett contributed to this story.*

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FRANK HAYES/FRANKLY SPEAKING

Wanted: Security champion

YOU PROBABLY SAW THE NEWS stories last week: A music Web site called CD Universe was hacked by an extortionist who demanded $100,000 to keep him from publishing 300,000 credit-card numbers stolen from CD Universe. CD Universe refused and called the FBI; a handful of credit-card numbers were published on a Web site that the FBI quickly shut down; the G-men are now chasing the bad guy.

Cue the screeching tires and gunfire — just like cops on TV, right?

That's one version of the story. Here's another: CD Universe left a gaping hole in its security, and now we're all paying the price — literally. That hole in Windows NT was no hacker's secret. It was discovered and publicized in mid-1998. Microsoft had a patch, and the Computer Emergency Response Team at Carnegie Mellon University had a fix — but CD Universe didn't apply it.

Even after word got out last November that attacks against this hole had skyrocketed, CD Universe's IT staff didn't close it. They couldn't be bothered until an extortionist grabbed the credit-card numbers. Then they called the FBI — spending *our* tax dollars to solve *their* security problems.

Which version sounds more appealing: CD Universe as heroic victim that refuses to break under an extortionist's threat, or CD Universe as hapless jerk that expects the public to pay for its own security failures?

The sad thing is, they're both true. And the scary thing is, they could both be you.

So how do you avoid becoming the next CD Universe? You can hire consultants. You can check out security-oriented portals like ICSA.net and Bugnet.com. You can dig into security newsgroups on the Internet. You can haunt your vendors' Web sites and make sure you apply every fix and patch.

All those tactics have their advantages. But maybe first you should put somebody in charge. You should find yourself a security champion — an IT staffer who has security as his No. 1 concern.

Let's face it, consultants will come and go. Advisory organizations can't force things to happen. You need someone who lives in your shop, knows your people and procedures and can agitate for whatever needs to be done.

He doesn't have to be a high muck-a-muck. He probably shouldn't be, because security would be just one item on the muck-a-muck's agenda.

He doesn't have to be your smartest technical whiz. Most security work doesn't take a Ph.D. or a genius IQ (though a good B.S. detector helps). Better is someone who's pragmatic, detail-oriented and relentless. Pragmatic because you want to block real threats, but not waste time or money on overblown wanna-be risks; detail-oriented and relentless because you don't want anything to slip through the cracks.

Most security work doesn't take a Ph.D. or a genius IQ.

This doesn't even have to be a full-time job — just the first priority for that IT staffer.

And that staffer *does* have to be someone who has — or can earn — the boss's respect. Who can explain threats in plain language. Who can take no for an answer and come back with new questions. Who will make security *the* issue, even when no one else seems to be listening.

Security policies won't do it — not without someone to push for effective action. Deciding "we'll all be security champions" won't do it — when security is everyone's job, it's no one's job.

So choose yourself a security champion and put him to work. Or be prepared for stories making your own IT shop out as heroic victim and hapless jerk.

Because sooner or later, you will be. ◗

Hayes, Computerworld's staff columnist, has covered IT for more than 20 years. His e-mail address is frank_hayes@computerworld.com.

SHARK TANK

NEXT WAVE in Y2K news: layoffs. (Wait a minute, wasn't this thing supposed to keep us all rich until 2003 or so?) One smallish consultancy axed half its Y2K staff on *Dec. 27*. Wanted to beat the rush, maybe. The other staffers got it nine days later.

AND THEN there was the contractor who developed the online version of a medium-size New England newspaper. "Did such a great job, the paper laid him off," a pilot fish reports. A possible Y2K bug occurred to the guy in December. But he was at a new gig. And less than thrilled with the way he'd been treated. When the paper's Web banner read "Monday, January 3rd, 3900," he was less than surprised.

HELP DESK is coaching a user through a date change. User gives it a try. Shouts: "I get an error that says '*Wrong date, dummy.*' " Try again, sir. "Nope. Same thing. '*Wrong date, dummy.*' " Help desk, baffled, asks him to read back the error exactly. User: "WRONG DATE DD-MM-YY."

GUY THING Kevin Smith is IS manager at Spyder Active Sports in Boulder, Colo. He's outsourcing his ERP system to an application service provider. What was the hardest part? Doing the contract? Nailing down quality levels? Nah. Smith says it was realizing he's "not going to have this great server rack that I could show off to people."

THIS CFO'S LAPTOP IS "a $4,200 paperweight," a pilot fish says. Never leaves its docking station. Then the CEO decrees all execs *will* get connected. CFO takes his laptop home a couple times. Disaster. "He can't figure out how to connect to his ISP, our VPN, or get Notes to load." Solution? The company buys him another laptop for his home. The Shark kids you not. Silver lining: "This one is only $3,700."

The Shark got all these swank Christmas gifties. Then a Cyveillance study said 4% to 8% of Web sites offering Gucci- and Rolex-branded products are peddling fakes. That explains the cold shoulder at the pawn shop. For an *authentic* T-shirt:, go to **sharky@computerworld.com**. To get swindled daily: *computerworld.com/sharky*.

The 5th Wave

E-mail richtennant@the5thwave.com

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